THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

# COMPUTERWORLD

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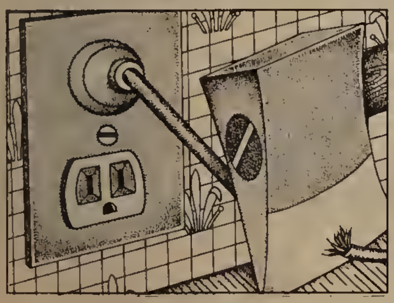

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# DEC aims higher

## Clustered VAXs target 3090 arena

**By Alan Alper**

NEW YORK — Digital Equipment Corp. last week extended its VAX family of computers to mainframe performance levels by unveiling two clustered configurations of its VAX 8700.

The two Vaxclusters consist of four and eight VAX 8700 processors, providing performance of 26 and 52 million instructions per second, respectively.

They are positioned to match the performance of IBM's high-end 3090 Models 200 and 400.

The Vaxclusters — named VAX 8974 and VAX 8978 — represent a renewed attempt by DEC to provide mainframe-level performance following the halt in development efforts three years ago of the Decsystem-20.

With the clusters, DEC introduced a disk subsystem offering 2.5G bytes of storage in a box occupying 5½ feet of floor space.

The company also showcased an ANSI-compatible structured query language implementation, software that manages distribution of relational data among multiple processors and enhancements to VAX DBMS and VAX RDB/VMS data base management systems.

Last week, analysts lauded DEC's move to extend its VAX clustering approach to the high end. DEC said it has already installed 5,000 Vaxclusters of lower performance machines.

"It gives them a nice way to pinpoint large accounts, which no doubt will help revenue and their profit margins," suggested Stephen Dube, an analyst with Shearson Lehman Brothers, Inc. in New York.

From a technology standpoint, however, some analysts said they expected more. "In reality, these systems don't run dyadically, and the disk subsystems still use conventional ferrite heads," noted Donald Haback, a vice-president of research with Nikko Securities Company International. "They have a long

See **DEC** page 8

# Rebound at IBM seen hampered by CPU trends

**By Clinton Wilder**

ARMONK, N.Y. — After ending one of its worst sales years in a particularly dismal fashion, IBM faces major challenges to restore profit growth this year, according to analysts.

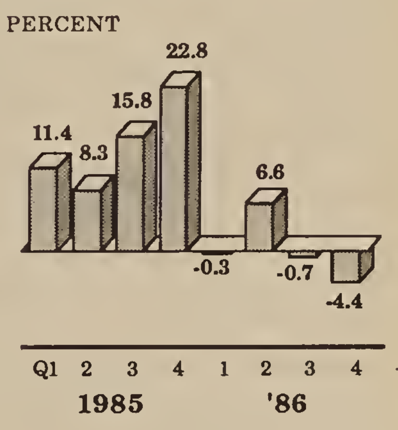
IBM said last week that its fourth-quarter earnings plunged 48% from year-earlier levels on a 1.2% decline in revenue. Although total 1986 sales increased by 2.4% to $51.25 billion, revenue from equipment sales dropped 0.4% from 1985 levels despite IBM's massive effort to convert its revenue stream from rentals to direct sales. It was the second consecutive year the company posted an annual decline in profits.

While many predict a second-half rebound based on reduced costs and new products such as the 9370 midrange system, others suggest that IBM's traditional approach to the computer industry has created fundamental barriers to future success.

"The company's strategy and cost structure was built on an expected 30% to 40% annual increase in mainframe processing demand," said analyst Thomas Rooney of Donaldson, Lufkin & Jenrette, Inc.

### IBM Revenue

*Equipment sales change compared with year earlier*



CW CHART

"More and more large users are pulling applications off the mainframe onto departmental and smaller systems, and that trend will con-

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# Overdue Apple server goes to market

**By Patricia Keefe**

CUPERTINO, Calif. — After almost two years of promises, Apple Computer, Inc. is expected this week to unveil Appleshare, an Apple-branded file server first announced 23 months ago.

The server, along with several Apple products and about 20 third-party Apple-oriented connectivity products, will be announced in San Francisco this week at The Seybold Conference on Desktop Communications.

Appleshare is a key part of Apple's connectivity strategy. It is actually a Macintosh Plus that features what sources say is "one of the better user interfaces to a sophisticated file server."

Released in conjunction with the server will be enhancements to Apple's user interface driver, Finder, that are said to provide support for a multiuser environment.

Apple evenutally plans to incorporate a data base developed in France under the name Fourth Dimension and known at Apple as Silver Surfer, but the task was more complex than Apple thought, an Apple analyst said. "They want to include it eventually, but it's not ready," he added.

**3Com hit by merger fever again, woos Tops firm. Page 91**

"The server is quite good; it will surprise a lot of people. Apple's got their act together this time," said an informed source familiar with Apple's plans.

In addition, Apple will announce PC Card, which will link IBM Personal Computers to an Appletalk network, allowing Macintoshes and IBM PCs to exchange files; Lasershare, a print spooler; DCA Filer, a card that links the Mac to Digital Communications Associates, Inc. files; and Apple Line 3270, which provides file transfer capability between the Mac and IBM 3270 environments.

In addition, the source said, products allowing Appletalk to run over Ethernet and fiber-optic cables will be unveiled.

The importance of these links lies in the integration of multiple environments — Apple, IBM and Unix — at the data and application levels.

Providing Appletalk links to Unix hosts and IBM-compatible micro-to-mainframe and 3270 environments will allow users to bring their Macintoshes in from the cold to function as part of the corporate DP system, whether operating in an IBM, multivendor or mixed-media environment.

"I think users will be very satisfied. They'll see [the Ap-

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# Users choke on Lotus copy scheme

**By Peggy Watt**

Many users of Lotus Development Corp. products are balking at the company's Extended Value Program, claiming the company's offer of non-copy-protected software requires them to function as piracy cops.

The Extended Value Program is part of an overall sales, training and distribution plan called the Multi-Value Plan.

A Lotus sales representative on the West Coast said at a Southern California corporate users group meeting that he has sold no contracts for Lotus's Multi-Value Plan, announced late last summer. While Lotus officials denied that was the case throughout the country, sign-up has apparently been sluggish.

Some managers complain that Lotus's proposal to "limit legal liability" of corpora-

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NEWSPAPER

# IRS qualifies tax section; placement firms impacted

**By David A. Ludlum**

WASHINGTON, D.C. — The Internal Revenue Service ruled last week that brokers and other firms that place technical workers in contract jobs may have to hire those individuals as full-time employees under a controversial section of last year's tax reform act.

The IRS said Section 1706 of the law applies to the relationship between a technical worker and an intermediary, such as a broker, that places the worker in jobs.

It does not apply to technical service employees who work under contract directly for the company for which they provide services. Many such companies have already terminated contracts with independent consultants and specialists because of uncertainty concerning the scope of Section 1706.

The law makes it more difficult for the workers placed by brokers to function as independent businessmen for tax purposes. It excludes them from so-called safe harbors existing in a 1978 law that, in effect, allowed most taxpayers who had been working as independent contractors to continue doing so.

### Independents face burden

Technical service workers — computer programmers, systems analysts, engineers, designers, drafters, consultants and others — who work as independents through a broker now face the burden of proving that they function as independent businessmen rather than as employees of the broker.

As was the case before 1978, they must meet 20 common law standards that the IRS uses to determine who is an employee. The standards concern the degree of control an organization has over a worker, including where and during what time work is done, whose equipment is used and how the worker is paid.

Independent workers who become employees will have income and Social Security taxes withheld from their pay and will lose an array of tax advantages and the ability to fund their own relatively generous pension plans. Many independents have expressed outrage over losing the freedom they now enjoy.

One group organized to fight Section 1706, Technical Consultants National Association (Tecna), still plans to lobby for repeal of the measure, according to Frank Lynch, a Boston attorney working with the group.

The IRS is urging independents who will become employees to file W-4 forms with their new employers as soon as possible, because without one, the employer is required to withhold income taxes at the highest rate that could apply.

The IRS said it will waive penalties on employers for unpaid Social Security taxes due for the first quarter of this year if the taxes are paid by April 30 and for other Social Security taxes not paid for "reasonable cause."

Also, employers face no penalties for failing to deposit workers' income taxes or workers' shares of Social Security taxes with the IRS if those amounts were not withheld from the workers' pay. Employers, however, may ultimately be required to pay all the taxes due.

### Sole group excluded from safe harbors

The technical service workers singled out by Section 1706 are the only occupational group to be excluded from the 1978 safe harbors.

The safe harbors were intended to be temporary, serving until Congress passed a law defining employee status, but Congress has yet to do so, said IRS spokesman Wilson Fadely.

Section 1706 was put forth by Sen. Daniel Patrick Moynihan (D-N.Y.) who, in response to the controversy over it, issued a brief statement saying it was designed "to ensure that technical services businesses that do business in the same way are subject to the same tax rules."

# HP cuts price of Model 840

**By James Connolly**

PALO ALTO, Calif. — Hewlett-Packard Co., citing production economies, last week cut the price of its HP 9000 Model 840 technical system 28% only two months after the reduced instruction set computer (RISC) began shipment.

"It was always our plan to reduce the price of the Model 840 after we had enough experience manufacturing it to fine-tune the production process. It just didn't take us very long to get the system into volume production and start achieving cost savings from the lower parts count and faster assembly time," said Carl B. Flock, marketing manager for HP's technical computer operation.

The price cuts, which apply only in the U.S., brought the list price of a base configuration down from $113,500 to $81,500.

One industry analyst said the HP price cuts also appear to be a result of the market's changing during the time between announcement and delivery of the Model 840, which was announced last May, four months after HP introduced its first RISC-based HP 3000 general-purpose systems. Shipments of the first of those general-purpose systems, the HP Model 930, were postponed from late 1986 to the middle of this year.

Analyst William Rosser of the Gartner Group, Inc., a Stamford, Conn.-based market research firm, said, "Whenever you have a long period between announcement and delivery, you may have to cut prices shortly after delivery just to keep up with the competition. The rest of the world keeps moving along, and HP wants to keep showing the world, 'Hey, this thing is something special.' "

Rosser said similar price cuts are likely for the HP 3000 Model 930 and other products with long lead times.

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# Users choke on copy scheme

From page 1

tions desiring non-copy-protected software actually boosts their liability.

They point to sections requiring a corporation to promptly investigate any allegations by Lotus that the firm's "employees, contractors or agents" are pirating Lotus products. Some managers object to Lotus's demand that corporations reimburse the vendor for each illicit copy made by an employee.

Under the Extended Value Program, users can qualify to receive a utility disk that removes copy protection from Lotus's 1-2-3 or Symphony.

### Qualifications

In order to qualify, corporations must have at least 100 copies of the latest version of 1-2-3 or Symphony, have policies against software piracy and sign a contract with Lotus to ensure that the firm is notified by Lotus of the piracy.

Firms are liable for only the retail price of the number of copies illegally made.

"The wording of the document is something that no one in their right mind would sign," said a corporate acquisitions manager who asked not to be identified because he still hopes to negotiate a workable contract.

Todd Greeno, manager of office technology at Pfizer, Inc. in New York, is eager for unprotected versions of the more than 500 copies of Lotus programs in his office. But he said he "won't go to extremes" for the privilege.

"I want software publishers to make my job easier, with the understanding that our company strictly prohibits illegal copying. We educate our users and bring the issue to light frequently," he said.

### The implication of guilt

Several managers said they strongly resented what they call an implication of guilt.

"No company should sign a contract for presettlement of transgressions that haven't happened," said Herbert Turner, systems analyst for Southern California Edison Co. in Rosemead, Calif. He handles site licensing and estimates the utility company has 2,000 copies of Lotus

"We have issued strong policies for three years," Turner said. "Ours even states violation could lead to termination. But we can only do so much in terms of training, reminding and disciplining." He said he wonders whether a company would have to pay Lotus if an employee sold illegal copies of the company software.

Some managers said their colleagues are nit-picking.

"The spirit of the agreement limits liability to copying on the business premises," said Robert Corr, director of technical services for Pacific Operations with Electronic Data Systems Corp.

"I think you're stretching it a bit to say a company is liable for an employee's action off the premises of the company and without the consent of the company. That employee would have committed several other crimes, including theft of company property and copyright theft," Corr observed.

His objection is to the continued inconvenience even of unprotected software under Lotus's plan.

"They won't give you an un-copy-protected disk," he said. "They give the user a utility to remove the copy protection. That imposes a cost and burden on corporations to go through these rather cumbersome procedures. It would be much easier if they just shipped un-copy-protected software," Corr said.

Lotus replied that its rules are simple.

"What's required is a policy in place against illicit copying and a set of procedures to address violations as an internal matter," said Mike Kolowich, vice-president of marketing and business development.

He said Lotus does not ask to be notified of violations discovered and handled by the customer company, but if Lotus refers a complaint to the user, the vendor wants a report of the results.

"We don't want to interfere, but where we remove physical barriers to our software, we want the company to do its work in making it known to employees that illegal copying is tantamount to theft of company policy," Kolowich said.

Still, a lot of corporate attorneys are taking a close look at the contract.

"Lately, anything that even looks like software provisions, I send to my attorney," said Joe Nixon, software acquisitions officer of the information services for the Commonwealth of Pennsylvania at Harrisburg. He said he faces the added ethical concerns of a governmental agency.

"You are expected to be above reproach," he said. There is no stated antipiracy policy, "but it's against the law, so we don't do it."

The acquisitions officer for a major defense contractor with more than 400 copies of Lotus products said the company's legal department advised against signing the contract.

The troubling provision requires a licensee to monitor its employees, contractors or agents in allegations of illegal copying.

Any U.S. Department of Defense contractor has too many subcontractors to accept that responsibility, the legal department reportedly said.

### Inconvenience over liability

"We're concerned about the legal risk of agreeing to investigate allegations made by Lotus and to present findings to them," the acquisitions officer said. "That put us up for a potential lawsuit from an employee." The company chose the inconvenience of copy protection over what it perceived as increased liability.

Lotus's Kolowich said the provisions are being misinterpreted.

"We're not asking for people or evidence to be turned over to us, we're just asking to be paid back at the retail price," Kolowich said.

He said, however, that Lotus is still open to individual negotiations, and several customers expect revisions.

"I really look at this as being a trial balloon," said Southern California Edison's Turner. "And I think this one was a failure. They want feedback from us as to what they are willing to buy."

EDS's Corr said he expects Lotus to succumb to pressure and eventually drop copy protection entirely.

"It's a vendor's right to impose any terms they can. Our alternative is not to buy the product," Nixon said. "Until users get tired of these kind of contracts and dig in their heels, there won't be changes," he concluded.

## Federal agencies gain 1-2-3 access

CAMBRIDGE, Mass. — While corporate users debated the merits of Lotus Development Corp.'s plan for the removal of copy protection, government users last week gained access to a nonprotected version of 1-2-3.

Many government agencies have policies against purchasing software that includes copy protection, and Lotus has lost sales as a result.

The version of 1-2-3 Release 2.01 for the federal government has no copy protection. Instead, the package has an initial screen that reads "Property of the U.S. Federal Government" and provides regulations against unauthorized duplication. Like the earlier release of 1-2-3, the package has a suggested price of $495.

A government version of Lotus's Symphony will be available later this year, according to the company.

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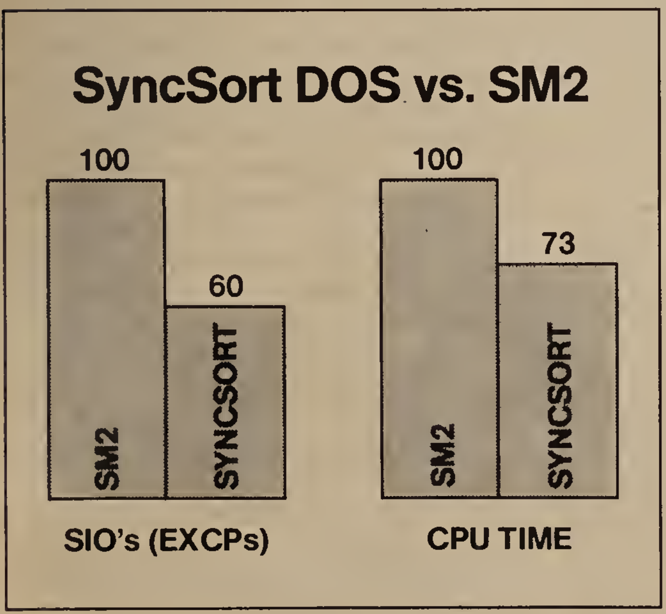

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# Vendors pull together to boost Unix standards

## Firms at Uniforum willing to cooperate

**By Elisabeth Horwitt**

WASHINGTON, D.C. — Exhibitors at Uniforum 1987, The International Conference of Unix Users, demonstrated that they are willing to surrender market dominance based on proprietary products in favor of a standardized, public-domain Unix environment.

"People are finally realizing that they've got to blow competition away on some other issue than interoperability," commented Daniel Lynch, president of Cupertino, Calif., consulting company Advanced Computing Environments.

One major thrust behind the standards is vendors' realization that a fragmented Unix cannot effectively compete in the mid-range system arena against emerging proprietary products from the likes of Digital Equipment Corp. and IBM, according to Geoff Morris, chairman of Unix vendor consortium X/Open.

"Unix vendors want to provide a standardized, mid-range solution before the big-system vendors finish moving their proprietary solutions down and shut off that market," Morris said.

### Support for Unix standards

During the conference held here last week, companies gave at least verbal support to emerging Unix standards that eventually will enable customers to port applications across a variety of Unix-based hardware.

Perhaps more significant was the growing number of companies willing to cooperate with competitors — or even adopt a competing product — in order to hasten commercial availability of the multivendor programming and networking products their customers demand.

One Uniforum '87 announcement exemplifying the new spirit of cooperation was made by sometime competitors Microsoft Corp. and Interactive Systems Corp.

The two companies will jointly develop and market a Unix-based operating system for the Intel Corp. 80386 microprocessor as well as a version of Microsoft Xenix System V that incorporates the functionality of AT&T's Unix System V.3. "It makes sense for us to work together rather than fragment Unix," noted Microsoft Xenix general manager Paul Maritz.

Even AT&T has announced plans to merge its Unix System V with Portable Operating System Environment (Posix), an open industry standard currently being developed by the Institute of Electrical and Electronics Engineers, Inc. (IEEE).

At a press conference held last Tuesday, AT&T spokesman William O'Shea reiterated AT&T's endorsement of Posix and the company's intentions to conform to the standard.

An IBM spokesman voiced that company's intention of supporting the standard, "once it is signed off."

However, industry representatives questioned the significance of vocal industry support of a standard that is still very much in its embryonic stage. The initial Posix module, 1003.1, just specifies operating system calls based primarily on System V, with a few from Berkeley Unix, according to DEC Ultrix technical engineer Glenn Johnson, referring to Unix Version 4.2 from University of California at Berkeley. The real obstacles, he added, will occur when IEEE starts working on Posix 1003.2, which incorporates a standardized user shell.

"Posix is great for application portability — we just wish there were more of it," said a Uniforum '87 attendee from the government sector. "It seems like, so far, they only have a small piece of what is needed."

But there remains the question of how to standardize around higher level functions such as the networking interface and distributed file system.

It might take IEEE years to develop such protocols from scratch, but the market will not wait for such action. Instead, some vendors have adopted as de facto standards already-existing commercial products that perform the functions mentioned above.

A growing number of products incorporate Streams, AT&T's specifications for interfacing a networking environment, with Unix System V.3's networking interface, Transport Level Interface. Both Convergent Technologies, Inc. and Wollongong Group, Inc. demonstrated Streams-compatible interfaces between Unix V.3 systems and Transmission Control Protocol/Internet Protocol networks.

While AT&T appeared to be gaining ground with Streams, the vendor's distributed file system Remote File System (RFS) lost some ground at Uniforum '87 to the emerging de facto standard, Network File System (NFS) from Sun Microsystems, Inc. AT&T and Sun's archrival, Apollo Computer, Inc., announced at Uniforum that both would support NFS.

Also during Uniforum '87, AT&T announced that it had joined X/Open, which has published a Portability Guide specifying a Common Applications Environment for Unix. X/Open's membership now consists of 11 hardware vendors including DEC, Hewlett-Packard Co., Unisys Corp. and seven European manufacturers.

X/Open members are committed to implementing the Common Applications Environment on their Unix systems by the third quarter, according to Morris.

### Software issues

On the software side, however, conflict is brewing due to X/Open's decision to incorporate into its standard certain protocols that already exist in proprietary commercial products.

The environment's incorporation of IBM's SQL facilitates interfaces with SQL-based data base management system products from Relational Technology, Inc., Informix Software, Inc., Oracle Corp. and Unify Corp., according to Morris. However, three out of four of the above products may have trouble interfacing with one component of the environment, C-indexed sequential access method (C-ISAM), a method for managing indexed files that was developed by Informix.

According to Oracle spokesman Michael Wallace, the use of C-ISAM, a proprietary protocol, in an industry standard "seems funny and may make competitors shy away."

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# Unix groups, AT&T plan to plug holes

**By Mitch Betts**

WASHINGTON, D.C. — Two Unix industry groups and AT&T announced last week that they will take steps to improve the security features of the Unix operating system, which security experts say is notorious for being "full of security holes."

Various efforts to improve Unix security were aired at a well-attended panel discussion at Uniforum 1987, The International Conference of Unix Users, held here last week. Panelists said the openness and flexibility that made Unix popular in the research community make it less than secure, particularly for use in sensitive government applications.

If computer security is defined as the controlled sharing of data, said Skip Egdorf, a member of the computer security group at Los Alamos National Laboratory in New Mexico, then "Unix is all sharing and no control." Security features of Unix have improved since it first emerged from the research community, he said, but it still has far to go.

One attempt at beefing up Unix security will be handled by the X/Open Security Working Group, a panel of the X/Open international consortium of computer vendors. Iveta Trautmanis, program development manager at Unisys Corp. and chairwoman of the working group, said the panel will first identify the security needs and then develop standards. Unisys is the partnership of former Burroughs Corp. and Sperry Corp. Trautmanis said the goal is to meet the security standards of the U.S. government's National Computer Security Center and the requirements of European privacy and data integrity laws.

Similarly, /Usr/Group, an international association of Unix vendors and users, has a new security subcommittee that intends to submit draft security standards to standards organizations, according to subcommittee Chairman Steve Sutton, a computer security consultant with Addamax Corp. in Champaign, Ill.

"Unless we standardize on security interfaces, we will run into problems with the interchange of data between systems with different security policies," said Steven M. Kramer, vice-president of research and development at Secureware, Inc. in Atlanta.

Lisa A. Kennedy, a systems engineer at AT&T in Summit, N.J., said that although AT&T's Unix System V has some basic security features, such as user identification, passwords and discretionary access controls, some customers require more rigorous security.

For example, she said, customers are demanding more extensive audit facilities, mandatory access controls and certification by the National Computer Security Center. Kennedy said AT&T plans, in future versions of Unix, to enhance the existing security capabilities, seek government certification of System V and work with the various standards-setting groups to improve Unix security.

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# DEC wraps Ultrix around entire VAX line

**By Mitch Betts**

WASHINGTON, D.C. — Digital Equipment Corp., in an announcement made here last week at Uniforum 1987, The International Conference of Unix Users, unveiled a version of its Ultrix operating system that includes significant enhancements and spreads Unix throughout the popular VAX family.

According to analysts at International Data Corp., a market research firm in Framingham, Mass., DEC wants to sell more mid-range systems to the federal government and the automotive and aerospace industries, which are heavy users of Unix.

In addition to running on all VAX machines, from the Microvax II to the VAX 8000 systems, Version 2.0 of Ultrix-32 includes a VAX C/Ultrix compiler said to decrease execution times for C-based programs.

Roger Heinen Jr., a DEC software engineer, said the C compiler is intended for "customers who desire to extract the utmost performance from their VAX hardware." He added that the product announcement reflects the fact that DEC is tired of losing application benchmark tests to other hardware vendors due to its earlier compiler technology.

The vendor said Version 2.0 also incorporates Network File System support, an implementation of the popular file sharing feature developed by Sun Microsystems, Inc.

In addition, Heinen said, the new version adds features that align Ultrix, which is based on the University of California at Berkeley Unix Version 4.2, with other industry standards, including AT&T's System V Interface Definition and the IEEE 1003 specification.

Also announced at Uniforum was Version 2.0 of Decnet/Ultrix, a networking software product that allows Ultrix users to link their systems to DEC's other software systems.

The vendor said it also includes a gateway between Decnet networks and Internet networks based on the Transmission Control Protocol/Internet Protocol.

The price of Ultrix-32 Version 2.0 ranges from $4,000 for eight users on the Microvax II to $70,000 on the VAX 8800. The C compiler is bundled with Version 2.0 at no additional charge. The price of Decnet/Ultrix Version 2.0 ranges from $600 for the Vaxstation II/GPX to $7,965 for the VAX 8800.

# Apple server goes to market

From page 1

ple announcements] as a serious offering," the source added.

Also expected at the conference this week is the announcement of a diskless workstation from 3Com Corp. in Santa Clara, Calif. 3Com is said to have a high-end IBM PC AT-compatible diskless workstation featuring an Enhanced Graphics Adapter, 3Com's network interface and the Lotus/Intel/Microsoft Expanded Memory Specification up to 1M byte. "It has everything except the disk and monitor," a 3Com dealer said. The product is targeted at data base applications and those in which there are security considerations.

Novell, Inc. in Orem, Utah, 3Com's local-area network rival, currently offers a low-end diskless workstation for $700. Its purpose is to lower the cost of adding more nodes to a network.

The dealer was told 3Com's diskless product would cost about $2,000. "Under $1,500 seems to be the price range more acceptable to the market," said Claire Fleig, research director for the International Technology Group in Los Altos, Calif.

### Mac-compatible 3+

3Com will also make an announcement concerning its promised Macintosh-compatible version of its 3+ network software. The product has been in beta test for several months but will have to undergo changes to make it compatible with Centram Systems West, Inc.'s Tops network operating system, said Robert Bressler, vice-president and general manager of 3Com's software division (see related story page 91).

In a separate announcement last week, 3Com said it has signed a letter of intent to purchase Centram (see story page 91).

Meanwhile, Novell is also working on Mac-compatible network software. Informed sources said Novell initially was going to launch Macnetware at the Seybold show but is not ready because it has once again run into difficulties with Apple. This is Novell's second attempt — announced at Novell's Networld trade show in October — to port Netware to the Mac environment.

An earlier attempt was abandoned by frustrated Novell officials faced with minimal cooperation from Apple. A source close to both companies said Novell has run into the same problems, but a Novell source said both companies are committed to the project. "It's just that Apple needs to clarify its networking protocols, like the interface for the operating system and the device driver."

Despite the wealth of Apple communications-related announcements at Seybold, users should not expect to see all the missing pieces of Apple's connectivity strategy. "They may see the beginnings of that strategy," International Technology Group's Fleig said, adding that the rest of the picture should unfold during this year.

"Apple is in a good position as far as its presence in the market," Fleig said. Apple has completed its turnaround phase and now has the opportunity to move forward — as opposed to last year, when it was struggling and racked with rumors, she added. "Business people are looking at Apple's products, which will give Apple a little more time to bring its strategy together than it might have had 48 months ago."

Less clear is the impact Appleshare will have on the third-party Apple file server market.

"I'd be concerned if I were 3Com or any vendor whose claim to fame is linking the Apple and IBM worlds," one source close to Apple and 3Com said. 3Com has a file server with a built-in Appletalk connector and sells products linking the Mac to the IBM world.

Third-party vendors with low-end file servers lacking the feature richness of Appleshare will probably do fairly well, the source said.

"I think there is still a need for several people to provide file servers," Fleig said.

# Fowler resigns after serving six years as FCC chairman

**By Mitch Betts**

WASHINGTON, D.C. — Mark S. Fowler, chairman of the Federal Communications Commission for the past six years, recently announced he will leave the FCC this spring. His successor is likely to be another ardent supporter of communications deregulation.

The favorite candidate to replace Fowler as chairman is Commissioner Dennis Patrick, who is leading the effort to further deregulate AT&T. Another contender is Commissioner Mimi Weyforth Dawson.

Fowler has expressed interest in becoming an entrepreneur rather than an industry lobbyist when he leaves the FCC.

He announced his resignation shortly before he was to face a bruising round of reconfirmation hearings in the Democrat-controlled U.S. Senate.

A Republican who has called himself "Mr. Deregulation," Fowler has in recent years encouraged the commission to reduce regulatory constraints on the seven regional holding companies so they could offer more services to business and residential customers.

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# User doubts face DEC's bid to capture data center from IBM

**By James Connolly**

While Digital Equipment Corp. apparently wants to steal market share from IBM in the large corporate data center, users reported last week that the introductions of the VAX 8974 and VAX 8978 are unlikely to have an immediate impact on IBM installations in their companies.

Immediate customer reaction to the announcement was less than enthusiastic, as managers in companies that run DEC equipment or combinations of DEC and IBM systems wondered whether the four- and eight-CPU configurations will address their specific needs.

The customers expressed greater interest in the simultaneous announcement of the 2.4G-byte SA482 disk subsystem, which they see as a replacement for existing DEC RA81-based 456M-byte disk systems.

The key question raised about the high-end VAX systems was whether the performance will meet DEC's claims. The vendor said the 8974 offers 20 to 25 times the power of a VAX-11/780 and that the 8978 is up to 50 times more powerful than the 11/780.

### Competing with 3090

Since the 11/780 has been generally rated at 1 million instructions per second (MIPS), DEC's claims placing the 8974 in the range of 20 to 25 MIPS and the 8978 at up to 50 MIPS make the machines appear to be competitive with IBM's high-end 3090 Model 200 and Model 400 mainframes.

Errol Sandler, director of scientific management information systems at G. D. Searle & Co. in Chicago, noted that the image the new configurations offer to applications and users will determine their power.

"I've been beating the bushes to find out what it is all about. I want to know whether it is in effect a single processor or a VAX 8800-style master-slave machine," said Sandler, whose company runs research and development on VAX 8600s and VAX 8650s and general business operations on IBM hosts. He said Searle officials have talked to other vendors about using non-IBM equipment for general data processing but that the DP operation remains heavily IBM.

However, Sandler said he has been waiting for the higher capacity disk drives largely because he hopes the new drives will be more reliable than the RA81 and will reduce the number of drives needed to support his data storage requirements.

Another manager who said he is wary of the performance claims is Angelo Privetera, director of information systems for Ball Aerospace in Boulder, Colo.

"I would need to actually benchmark the systems. I still think that in a business environment with a variety of applications, you need to benchmark each system based on your own environment," Privetera said. Ball uses VAXs to support scientific and engineering users and to handle general business applications relating to those users. Ball runs most business and financial applications on IBM mainframes.

Privetera noted that while DEC has received national attention for trying to drive into IBM's data center market, he has seen a greater attempt by IBM to push into DEC's traditional markets in science and engineering.

### 'Above what we need'

Another manager questioned about the announcements said he is unlikely to move up to the 8974 and 8978. Roy E. Johnson, information systems director for Grinnell Mutual Reinsurance Co. in Grinnell, Iowa, said, "From what I can tell, they are above what we need." Johnson's firm runs its own insurance software on seven VAXs.

However, Johnson said he has noticed a DEC penetration into IBM's market share in other insurance firms.

Johnson also said a shift to the larger disk subsystem is unlikely since his company has excess capacity on its RA81s.

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# DEC aims high

From page 1

way to go to catch IBM."

Grant Saviers, DEC vice-president of storage systems, said a subsystem — the SA482 — would be the last generation of DEC large-scale storage products to use ferrite heads. IBM uses thin-film heads on its high-end 3380 direct-access storage device, which has enabled it to provide 2.5G bytes of storage per actuator.

Aimed at the data centers of large commercial and scientific corporations, the clustered systems are designed to handle traditional mainframe applications such as accounting, electronic funds transfer, management of large data bases, data processing and research and development, the Maynard, Mass.-based firm said.

The multiprocessor systems do not perform parallel processing but operate as independent processors, the firm added.

Although the systems seemed aimed directly at IBM's large system market, the company downplayed any confrontational intentions. "The strategy is not specifically to replace IBM systems, since people have made significant hardware investments, but to allow VAX/VMS systems to gracefully coexist with IBM," said Rose Ann Giordano, DEC vice-president of consultant and information marketing.

### DEC approach applauded

Yet Thomas Nies, chairman and founder of Cincom Systems, Inc., whose firm markets software to IBM mainframe and VAX users, said his customers feel DEC is taking a better approach to computing, particularly in production environments. He said it is not a question of how many MIPS a system offers but how much power is provided for applications processing after accounting for systems software.

"DEC delivers more MIPS," he said, noting that 85% of the MIPS offered on the new Vaxclusters are usable for applications processing, compared with only 60% on the high-end IBM 3090s.

With the Vaxclusters, DEC is offering a one-year hardware warranty, one-year software support and a resident systems engineer to help tailor application development to business needs.

The four-processor VAX 8974 comes standard with 128M bytes of main memory, expandable to 512M bytes; the new SA482 2.5G-byte storage subsystem; dual HSC70 controllers; a TA78 dual-density tape drive; a Decserver handling up to 200 terminals; a Vaxcluster Console system, consisting of a Microvax II, Ethernet networking capability and VMS and Decnet software licenses; and a VAX Performance Advisor software license. Up to 16 8700 processors can be clustered, DEC said.

The eight-processor VAX 8978 comes with 256M bytes of main memory, expandable to 1G byte, two storage subsystems, four I/O controllers, two dual-density tape drives and two Decservers, handling 400 terminals. Up to 32 8700 processors can be clustered, the firm said.

## Big systems arena

*DEC's target market and starting point*

| *Systems* | *Units (installed bases)* |
|---|---|
| IBM 3030/3080 | 4,934 |
| IBM 3090 | 773 |
| DEC VAX 8500/ 8550 | 13 |
| DEC VAX 8600/ 8650 | 2,640 |
| DEC VAX | 25 |

INFORMATION PROVIDED BY COMPUTER INTELLIGENCE, 1986.

By purchasing the multiprocessor packages, which include disk and tape storage, operating systems and networking software licenses, customers will spend between 10% and 15% less than if they purchased the components separately, analysts said. Available 90 days after receipt of order, the VAX 8974 is priced at $2.6 million, while the VAX 8978 lists for $4.7 million, the firm said.

Each processor in the system can be upgraded to the VAX 8800, although DEC did not provide pricing or availability schedules.

The new SA482 storage array consists of four head-disk actuators providing 2.5G bytes of storage, 36% more storage than previous DEC products. Each HSC70 I/O controller supports eight data channels and can accommodate up to 20G bytes of on-line storage.

While the new SA482/HSC70 subsystem is an integral part of the new Vaxclusters, it can also be used with other VAX and PDP-11 systems because it conforms to Digital Storage Architecture and Standard Disk Interconnect. Available immediately, the SA482 lists for $84,000.

DEC's ANSI-compatible SQL — VAX SQL — is a software development tool to be used with VAX RDB/VMS relational data base management systems and VIDA VAX-to-IBM Data Access product. It can be used with local and remote data bases and is available immediately for a licensing fee of $1,770.

### Enhanced VAX DBMS

DEC has enhanced VAX DBMS and RDB/VMS for use with VAX SQL. DBMS Version 3.2 is said to run twice as fast as earlier versions and to more easily restucture data bases.

In addition to offering an SQL interface, RDB/VMS Version 2.2 now has a VAX C compiler and support for distributed data base management capabilities through another new software package called the VAX Data Distributor.

Data Distributor manages the automated distribution of relational data among multiple processors running the VAX/VMS operating system. It will begin shipping next month and is priced at $1,800 for the Vaxstation II workstation to $27,000 on the VAX 8800.

VAX Performance Advisor, performance analysis software for single and multiprocessor VAXs running the VMS operating system, is currently available. Licenses begin at $5,500, the firm said.

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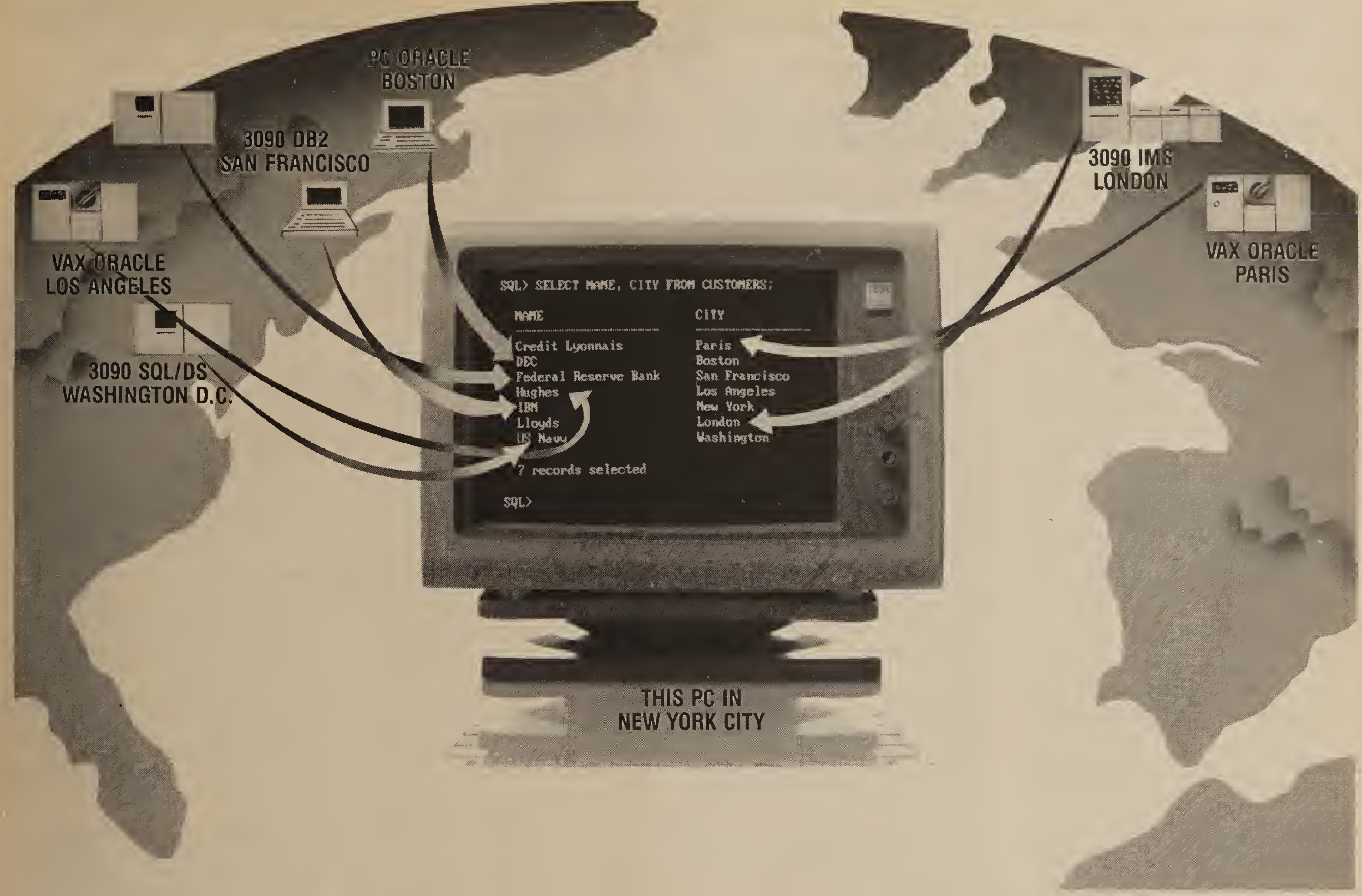

```
SQL> SELECT NAME, CITY FROM CUSTOMERS;

NAME                        CITY
----------------------      ----------------
Credit Lyonnais             Paris
DEC                         Boston
Federal Reserve Bank        San Francisco
Hughes                      Los Angeles
IBM                         New York
Lloyds                      London
US Navy                     Washington

7 records selected

SQL>
```

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# Amdahl lowers entry point, adds 3090-class uniprocessor

## Aims to lure low-end, expanding buyers

**By Jeffry Beeler**

SUNNYVALE, Calif. — Amdahl Corp. last week extended its IBM 3090-class mainframe line at the low end with the addition of an entry-level uniprocessor that Amdahl claimed yields roughly 30% better price/performance than the 3090 Model 180.

With throughput estimates of more than 21 million instructions per second (MIPS), the Amdahl 5890-190 provides up to 54% the execution rate of Amdahl's existing 5890-300 dual processor.

Though much less powerful than the 41-MIPS Model 300, the 190 is said to be better suited than the two-way CPU complex to applications in which transactions have to be processed serially.

"For environments where each execution step depends upon the completion of the one that immediately preceded it, users gain nothing by having more than one engine," said Dennis Stein, Amdahl's manager of processor systems marketing. "What those kinds of users need when the time comes to upgrade their systems is a bigger uniprocessor."

In a formal statement that coincided with its Jan. 20 announcement, Amdahl characterized the 190 as the largest uniprocessor it has ever made — a distinction that previously belonged to its 5860, which will continue to be sold.

### Faster than 5860

Compared with the existing 5860, which executes one machine cycle every 18.5 nsec, the 190 is rated at 15 nsec and boasts improvements to both its cache algorithms and pipelining techniques, Stein said.

The combination of a reduced machine cycle time with other design refinements, he explained, makes the 190 approximately 50% faster than the 5860, which executes 14 MIPS.

The introduction of an expanded Amdahl uniprocessor creates a natural growth path for 5860 users who are locked into serial processing requirements but who need more power than their current engines can deliver, Stein said.

Announcement of the 5890-190 also lowers the entry point to Amdahl's 5890 mainframe series — a much-needed move, according to Steve Terry, corporate systems services manager at Unisys Corp.'s Peripheral Products Division and a 5860 user. Unisys is the result of the merger of the former Burroughs Corp. and Sperry Corp.

Upgrades to the previous entry-level 5890 machine, the Model 200, were not available for users of the Amdahl 580 series models that competed with the IBM 3080 family.

### 'Letting users grow'

Now, however, "Amdahl is clearly giving its users a way of entering the 5890 with a lower MIPS rating and then allowing them to grow to larger members of the family," Terry said. "Their strategy is excellent, because they have many users in the 5- to 10-MIPS range plus another large group at around 15 MIPS and need to get their entry point as low as possible."

A similar view of the 5890-190's debut was expressed by Daniel Benton, a securities analyst with New York-based Goldman, Sachs & Co. "An awful lot of users of 580-series mainframes will probably see Amdahl's latest announcement as a bridge to the 5890 line," he said.

But as an upgrade path, the 5890-190 may prove most attractive to users of Amdahl's 5840 and 5850 uniprocessors, Benton added. Both the 7.5-MIPS 5840 and the 10-MIPS 5850 are deliberately degraded versions of the 5860.

Although the 5890-190 will probably go primarily into Amdahl's own installed base, it may also snare some users who might otherwise have acquired IBM 3090 Model 150s or Model 180s, according to John Jones, a senior analyst with Montgomery Securities, Inc.

"In fact," Jones said, "the single-processor 190 is only slightly less powerful than IBM's dual-processor 3090 Model 200 and costs substantially less." Moreover, with a maximum capacity of 48 channels and 256M bytes of main memory, the Amdahl mainframe offers greater expandability than the Model 180, which holds only up to 32 channels and 64M bytes.

After it reaches its expansion limits, the 190 can be upgraded further to a 5890-300, which in turn can become a 70-MIPS 5890-600, a four-way processor complex that marks the top of Amdahl's mainframe line.

The 5890-190 is geared chiefly for IBM CICS, batch and other applications containing "transactions that are queued and then executed one at a time," Amdahl's Stein said.

Like the other three members of the 5890 family, the 190 supports Expanded Storage and Amdahl's Multiple Domain Feature, which allows up to four discrete operating environments to reside concurrently in the same CPU.

In a basic configuration incorporating 16 channels and 32M bytes of main memory, the machine costs $2.63 million, with shipments scheduled to begin in March.

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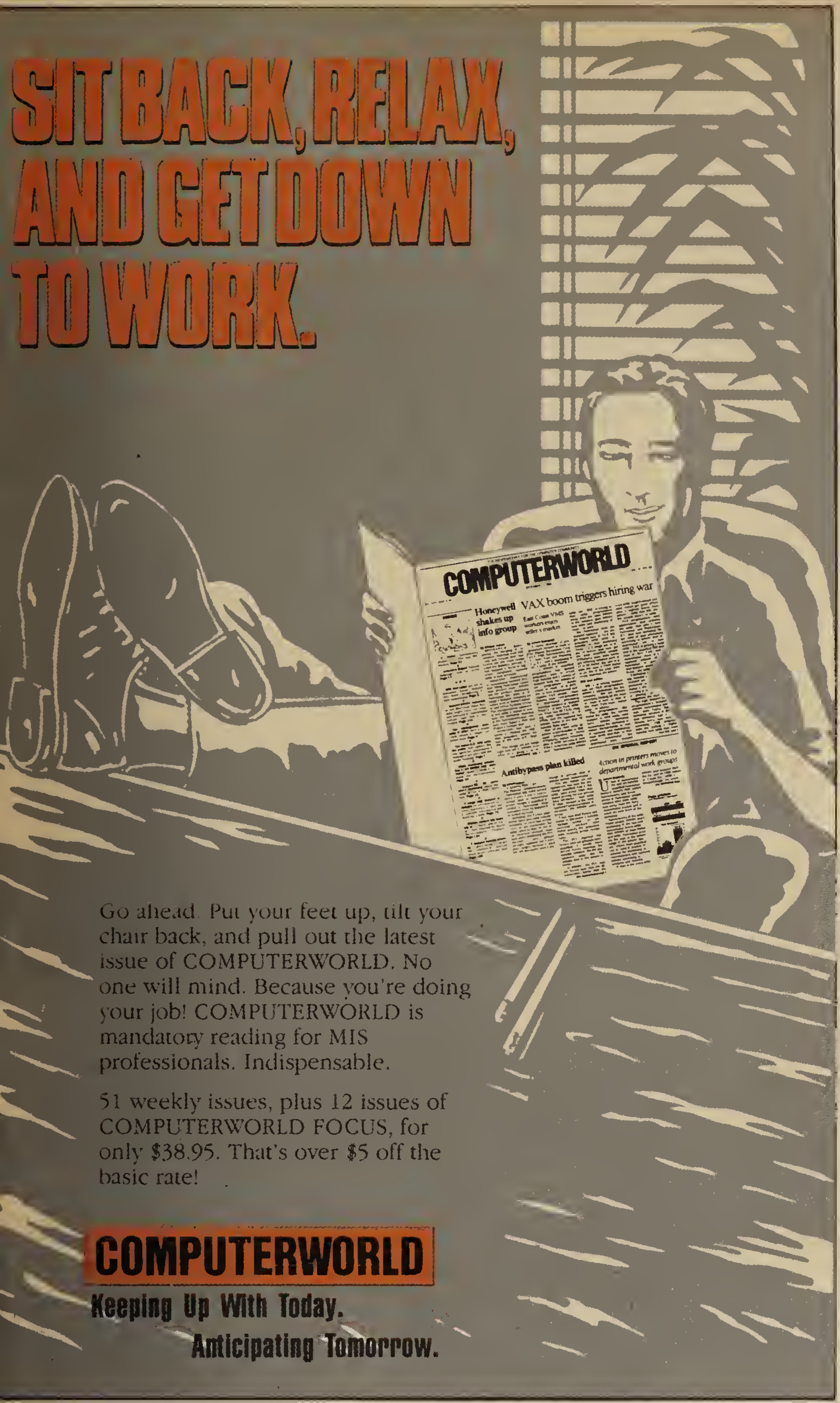
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3317-8704

# Prime beefs up Series 50 with 2755 office machine

**By Stanley Gibson**

NATICK, Mass. — Prime Computer, Inc. beefed up the mid-range of its Series 50 32-bit superminicomputers last week by announcing the 2755.

Prime claims the machine is its highest performance office system, offering an average of 20% to 25% better performance than its predecessor, the 2655 superminicomputer, at an average price increase of 4%.

The supermini is designed to exist outside a computer room, in offices or other work areas where up to 128 terminals can be directly attached.

### A departmental system

"It can handle complex computing problems for a business that may not be prepared to support the cost of a computer room system. But it's not limited as a stand-alone; the 2755 can operate effectively as a departmental system in a broader network that includes personal computers and corporate mainframes," said Stephen C. Kiely, vice-president of systems marketing and development for Prime.

The machine's performance increases — up to 35% more than the 2655 — are the result of reduced memory-access time, enhanced handling of machine instructions and an enlarged cache memory. The 2755 CPU executes approximately 1.6 million instructions per second (MIPS), compared with 1.3 MIPS by its predecessor, according the the vendor.

The 2755's features include 64K bytes of cache memory, quadruple that of the 2655; 16M bytes of main memory, double that of the 2655; and support for up to 128 directly connected terminals, also double that of the 2655. Maximum on-line disk storage is 4.2G bytes.

It can also provide for up to 63 remote users connected via Primenet software, a distributed network for both local- and wide-area communications.

### Peripheral support

The 2755 is hardware and software compatible with other Series 50 computers and supports the same peripherals as other machines in the 50 series.

Users of the 2655 can change their system to a 2755 by using an in-cabinet upgrade. The 2655 was introduced in October 1985.

Available for immediate shipment throughout the world, a basic configuration of the 2755 system ranges in price from $95,050 to $133,200.

# AT&T cuts Unix PC prices

**By Patricia Keefe**

MORRISTOWN, N.J. — AT&T Information Systems has slashed the prices of its Unix PC 7300 and 3B1 by as much as 32%, also reducing prices 12% to 17% on its PC 6300 and PC 6300 Plus.

The cuts coincide with reports that AT&T will soon announce an enhanced version of its Intel Corp. 80286-based 6300 Plus that will feature IBM Personal Computer AT bus compatibility.

The first-ever price reductions on the Unix PC and 3B1, both manufactured by Convergent Technologies, Inc. in San Jose, Calif., have also fueled speculation that AT&T this year will quietly drop the Unix PC and what remains of its foundering relationship with Convergent.

AT&T spokesman Mark Siegal declined to comment on speculation that the Unix PC will be killed, characterizing the Unix PC price cut as a response to market conditions.

"What we have found with all our computers is that price is becoming an increasing factor in the purchasing decision," Siegal said.

But in an interview last month with CW Communications International News Service, Bruno Lamborghini, chief economist for Ing. C. Olivetti & Co., said the Unix PC would be phased out in 1987.

AT&T owns a 25% interest in Olivetti. In October, in a move lauded by analysts, AT&T strengthened that relationship by turning over responsibility for future personal computer development to Olivetti. Lamborghini said he expects U.S. sales to improve now that Olivetti is in charge.

# Ashton-Tate finally ships Rapidfile

**By Douglas Barney**

TORRANCE, Calif. — According to beta-test users, Ashton-Tate's Rapidfile software was not rapid enough, a problem which delayed the product's shipment until last week.

"We decided we were going to lose a lot more credibility if we shipped when it wasn't ready than to miss our date by a few weeks," said Mike Arrigo, Ashton-Tate's product manager for Rapidfile.

Rapidfile, a $395 file management package, was originally scheduled to ship last December, but users' and analysts' criticisms of the time it took to load files from Dbase III, the dominant microcomputer data base package, caused Ashton-Tate to rework the package.

"We improved the time it takes to load a Dbase file. Because it is a disk-intensive operation, you get the most amount of improvement on a floppy-based system, up to 10 times, and on a hard disk, it is twice as fast," Arrigo said. "We did some benchmarks in our test department, and in an extreme case, a 60,000-record file that used to take 40 minutes to load now takes four minutes."

Ashton-Tate also speeded up the product's file sorting. "We saw increases of 15 to 20 times in sort speeds on very large files," Arrigo said.

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# Firms ready systems to rival delayed MS-DOS release

## Shipments scheduled to start next month

**By David Bright**

Microsoft Corp.'s industry standard MS-DOS personal computer operating system will soon have some competition.

While corporate interest in the new class of Intel Corp. 80386-based personal computers is growing fast, Microsoft's new version of MS-DOS, which will take partial advantage of the new systems, may not be released for eight months or more, according to most reports.

The new version is expected to provide multitasking and eliminate the 640K-byte random-access memory barrier of the current versions. Even then, the operating system will probably be designed for the 80286-based IBM Personal Computer AT and compatible systems.

### Alternatives

In the meantime, several 80386-based alternative operating systems — some of which are said to be MS-DOS-compatible — will become available in the first and second quarters of this year.

Considering the time lag with the new MS-DOS, along with some of its expected limitations, developers of alternative operating systems may suddenly have a "window of opportunity," says Dataquest, Inc. analyst Norm DeWitt.

It is DeWitt's understanding that DOS 5.0, as the new version is often called, will provide multitasking for applications that have been rewritten for it. Only one MS-DOS 3.X application will be able to run at the same time as the new programs. "This may mean that the end users are very likely going to be forced to go out and buy all new software to take advantage of the multitasking capability," he says. DeWitt adds that developers at this point report they have found that 3.X applications run slower on an 80386-based system than they do on an 80286-based machine.

Up to now, most systems managers simply have not had enough information about the new operating systems to make a decision. Although many microcomputer managers have vowed to stick with the standards and wait for IBM and Microsoft's next moves, some managers say they may investigate the new software.

At Eaton Corp.'s world headquarters in Cleveland, PC support center manager Fred Zickert says he may take a look at the new systems if they offer MS-DOS compatibility. "Certainly we're not afraid of them," he says. "If they strike our interest, we will be taking a look at them because right now we are beginning to get a backlog of requests [for 80386-based machines]."

Other managers already seem to have made up their minds as to which direction to take, however. There are too many unknowns and no turning back once the alternative systems are installed, notes Ed Macke, manager of PC systems at Northrop Corp.'s Defense Systems Division in Rolling Meadows, Ill. Macke says he would not have time for the extensive testing that would be necessary.

The competing operating systems are being readied at such companies as Softguard Systems, Inc., The Software Link, Inc., Pick Systems and Theos Software Corp.

Operating systems that run Unix and MS-DOS applications simultaneously on 80386-based systems are also being developed by a Microsoft/Interactive Systems Corp./Phoenix Technologies, Ltd. triumvirate, as well as by Locus Computing Corp. and Microport Systems, Inc.

Softguard Systems' VM/386 environment will use the 80386's virtual-machine feature to perform multitasking with MS-DOS and other operating systems at the same time, according to the company.

Claimed to be a superset of MS-DOS, The Software Link's PC-MOS/386 will reportedly also run several MS-DOS programs simultaneously and run 32-bit applications using standard MS-DOS commands.

### Software Link to ship system

The Software Link plans to ship its operating system next month. Softguard also expects to ship a single-user subset of VM/386 next month for running 32-bit applications, while the target date for VM/386 is June.

Pick Systems may have its non-MS-DOS-compatible Pick 386 operating system ready in the second quarter, says sales manager John Marshall. Pick Systems' software already boasts a strong following, with more than 2,000 applications from microcomputers to mainframes, according to Marshall.

The Theos system was derived from Oasis, a highly acclaimed multiuser operating system common on Zilog, Inc.'s Z80-based systems in the late 1970s and early 1980s.

Theos Software's Theos 386 currently runs on a multiuser microcomputer system and will, in the future, be ported to 80386-based PCs as well, according to Theos President Susan Catalano. The company also provides an MS-DOS emulator that runs under its 80386 and 80286 operating system versions.

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# Cullinet seeks joint ventures in aggressive CIM strategy

**By Rosemary Hamilton**

WESTWOOD, Mass. — Cullinet Software, Inc. last week outlined a highly ambitious computer-integrated manufacturing (CIM) strategy and paid product introductions will begin this spring.

The announced CIM plans were part of a status report on the corporate strategy Cullinet announced last September. The CIM plan is based on the challenging goal of eventually offering more than 30 additional CIM products resulting from either product acquisitions or joint ventures.

Cullinet's CIM scheme starts with the premise that the firm cannot offer customers all the necessary software components of a CIM solution, company officials said. "We have the technical foundation and many applications," said Charles Nedell, director of application product services. "What we don't have is many other applications that we don't intend to do because there are good products already out there."

According to Fred Gafner, a CIM product manager, Cullinet has identified 55 CIM-related applications, from computer-aided design (CAD) to job scheduling on the shop floor. Of those, Cullinet currently markets 22 packages, which make up the Cullinet Manufacturing System, as well as its products for repetitive manufacturing environments.

### Strategic partners

The remaining 33 applications will eventually be offered to Cullinet customers and will result from either product acquisitions or joint development and marketing arrangements with hardware and software vendors, Gafner said. Cullinet would not release specific information on these potential product acquisitions or strategic partners.

However, Gaftner said Cullinet is currently negotiating with some of the major CAD vendors, including Cadam, Inc., to form strategic alliances and develop gateways to link the vendors' software environments. A gateway product that would, in effect, function as Cullinet's end of the link is about to be tested, Gafner said. It is a joint effort between Cullinet and a software development company, the name of which Gafner said he could not disclose.

Tom McDoniel, director of commercial products, said he sees these partnerships as more promising than the Cullinet agreement with Lotus Development Corp., a partnership that also involved a gateway product and eventually collapsed.

"The Lotus agreement concerned competitive products," McDoniel remarked, "whereas these will be with vendors who offer something we don't plan to."

Of the 33 applications Cullinet plans to offer, the vendor said it will pursue strategic partnerships for 17 of the applications and is seeking to buy either technology rights or actual products for the remaining 16 applications.

In addition to the CAD area, a strategic partnership is expected to be forged with a shop-floor data collection vendor, said Gafner, who explained that customer surveys have identified this application and CAD as the top two priority areas.

There are at least a half dozen applications at the cell level on factory floors, such as those applications that govern numerical control equipment, that also lend themselves to joint ventures because "they're very hardware driven, and we're not in the hardware business," Gafner said.

On the product acquisition side, Gafner said the two priority areas are forecasting and project management, although he could not announce specific plans other than to say discussions are under way.

# Banyan to ship 386 products

**By Patricia Keefe**

WESTBORO, Mass. — Banyan Systems, Inc. will ship an Intel Corp. 80386 version of its Vines distributed network operating system by midyear, followed by an 80386-based file server by year's end, a company official said last week.

"Users don't care [about particular processors], but they want performance. We think the 386 is a good solution," said Robert Stearns, vice-president of marketing.

Specifically, Banyan users can expect to achieve higher performance and more storage capability and to be able to run more local-area networks concurrently under Banyan's 386-based solution, Stearns said.

For example, Banyan's current server can support 20 serial ports. The 386 server will double that capacity, support more peripherals and feature more sophisticated communications applications.

Vines 386 is simply an enhanced version of Vines 286 running in 386 mode, Stearns noted. "It's not a terribly difficult task."

Like its competitors, Banyan is not waiting for IBM to release its much-anticipated 386-based personal computer.

"I'm not worried about [IBM's plans] with the 386. They have a lack of server technology in general. Whatever IBM does will not directly impinge on us," Stearn said.

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# VIEWPOINT

## EDITORIAL

## The look and feel of a can of worms

The pair of lawsuits filed by Lotus Development Corp. alleging illegal cloning of 1-2-3 has created a stir befitting the potentially enormous consequences of the suits. There are a lot of worms stirring within the documents Lotus filed in federal court. The only birds likely to leave this debacle feeling satiated are the lawyers.

No, this isn't the basic software copyright suit, where the plaintiff charges unlawful copying of code. Rather, Lotus is contending that a couple of moderately successful packages are illegal because they look and feel like 1-2-3.

The first thing the judicial system will have to decide is exactly just what "look and feel" means. Once that problem is licked, the court will have to determine if a company can lay exclusive claim to the look and feel of its software. The courts will then pass judgment on the matter. And five years later, when the appeals process has come to a conclusion, they will announce the winners and losers.

However, we won't have to wait five years to feel the repercussions of this suit. One company developing an Intel Corp. 80386-specific operating system sent out press material last week, stating that its operating system is not a superset of Microsoft Corp.'s MS-DOS — as previously described — but rather an independently developed system.

There just aren't that many companies willing or financially able to go toe-to-toe in court with the Lotuses or Ashton-Tates or Microsofts of the world.

Further, the Lotus suit is sure to make some current and potential users of the alleged imitators skittish as they wonder if future enhancements of and support for the alleged copycats will be available.

Clearly, Lotus or any other company should enjoy the protection of the law when someone steals what's rightfully theirs. In Lotus's case, the company has much to lose to relatively cheap knockoffs of its 1-2-3 cash cow.

Users also stand to lose tremendously if protection can't be guaranteed for costly research and development efforts aimed at producing advanced computing solutions that imitators simply steal. The computer industry has been the scene of some of the most blatant and outrageous of copyright violations. Software is a prime candidate for such rip-offs, because actual package production costs are so low — once a market is established, that is.

But in its filings in court, Lotus says that the two packages in question are "copies — albeit, inferior copies." At a press conference in which the suits were discussed, company officials stressed that the packages posed no great threat to Lotus.

So if the packages are inferior and pose no great threat, just what is Lotus after? The answer would seem to be the market the company essentially created and now feels it should essentially own.

## LETTERS TO THE EDITOR

### Tax reform vs. competitive sabotage

My thanks to *Computerworld* for the article, "Tax reform dooms DP free-lancers" [CW, Dec. 15].

I am dismayed to see, once again, how the actions of just a few self-serving individuals adversly affect the livelihood and prosperity of so many. I strongly resent the insidious manner in which the technical service firms managed to sabotage their competitors under the guise of the tax reform bill. They managed to get the Joint Committee on Taxation to put Section 1706 into the bill, which makes it illegal for their competitors to continue doing business. The public was never told about this until after the fact.

Not only are the individuals running the technical service firms unwilling to attempt to compete in the normal marketplace, they are unwilling to expose their political activities to public scrutiny and debate.

What sense does it make to claim that the use of subcontractors gives some consulting firms an unfair advantage over others?

If the larger technical service companies thought it was more profitable to use subcontractors, they could have used them themselves, rather than trying to force everyone else to do business the way they do.

If the Independent Computer Consultants Association does not launch an all-out effort against Section 1706 of the tax act, it not only will be failing to serve its members but will simply disappear, along with those it represents.

While the stated purpose of Section 1706 is to collect more taxes, it is clearly an effort to remove competition. It will have the effect of taking money from the pockets of practically everyone involved.

The independents who become contract employees will make less money or will leave data processing, and the smaller, more efficient consulting businesses will vanish because it isn't practical for a small firm to keep year-round employees for unpredictable short-term projects.

With the lower end of the price scale removed, only the higher priced technical service companies will remain, with these higher costs passed on to the client.

Clearly, when there are dollars involved, ethics, morality and common decency don't even seem to exist.

**Phil Nowak**
Chicago, Ill.

### *Parlez-vous* videotex?

In response to Michael A. Conniff's article, "Videotex: Beyond the word" [CW, Nov. 3], I believe Conniff to be a little bit lost in the videotex world. Saying that "the French government came ashore . . . calling their solution everything from 'antiope' to 'telematics' to 'minitel,' " gives me the feeling Conniff also doesn't know the differences between them.

Antiope is a private service available on a television through Hertzian waves. It has nothing to do with videotex. Telematics is a general term that merely means telecommunication. It has still nothing to do with videotex except that videotex is a technology in the telematics scope. Minitel is the device name of the terminal through which people access videotex services. For Conniff's own knowledge, there is only one word regarding French videotex: It's Teletel.

In addition, French videotex is becoming a multimillion dollar industry. Videotex traffic in France totaled 2,325,254 access hours, with 1,724,193 Minitel terminals in active use. Featuring over 2,000 services ranging from bulletin boards to electronic banking, shopping, mailing and specialized data bases, videotex, in France, works.

**Laurent Van Huffel**
Manager of Marketing Support
United Software Systems and Services Corp.
New York

### A key player in parallel processing

Your article, "Parallel Processing" [CW, Dec. 22], was both interesting and disappointing. It was interesting from the point of view that you believe this type of architecture's time is about to come and that the major vendors are slowly but surely moving toward this technology. It was, however, disappointing that Encore Computer Corp., an early leader in developing the technology and a successful key player in this area, was only given a name mention as an example of multiprocessing.

Please keep in mind that Defense Advanced Research Projects Agency (also mentioned in your article), after a highly competitive bid, chose Encore and our Multimax technology as the company and architecture of choice to build a 1,000 million-instructions-per-second, general-purpose system. As a result of this $10 million award, Encore will be

**Continued on page 18**

# VIEWPOINT

## *Waiting for the wind to go out of software pirates' sails*

**By DAVID H. AHL**

How much is piracy costing the American computer industry?

It depends on whom you listen to. The Department of Commerce estimates that all piracy — including that of records, tapes, books, computers, software and the like — costs U.S. vendors $1.3 billion per year, according to Harvey Bale Jr., assistant U.S. trade representative. Computers and software represent more than half of that total, about $800 million.

However, according to an analysis by Apple Computer, Inc., the cost is much higher. Albert Eisenstat, Apple senior vice-president, says hardware and software piracy has cost the U.S. computer industry in excess of $20 billion in the last five years, with an attendant loss of some 750,000 jobs.

### Legitimate packages

A 1985 study by Future Computing, Inc. projects software losses alone at about $800 million per year. The study further estimates that for every legitimate personal computing software package in use, one unauthorized copy exists. However, a study by Infocorp covering the same period indicates that software publishers are losing only about $170 million per year — a fraction of their $5 billion in revenues. Microsoft Corp. seems to agree with this assessment, according to corporate spokesman Marty Taucher, who says, "We've never run into copying as a major problem."

On the other hand, The Association of Computer Retailers reports that software, which represented some 25% of members' sales in 1984, has dwindled to only 6% of sales in 1986. A recent issue of "Electronic Education" was entirely devoted to the problems of piracy. The articles noted two disturbing results of piracy: the abandonment of the education software market by several major publishers and the reduced incentive for software authors to develop new, innovative packages.

It is clear that certain portions of the market are affected more than others. Publishers and retailers of educational, home and widely used business packages seem to be deeply affected, while value-added resellers and producers of custom packages seem to be largely unaffected.

What is also clear is that user friendliness and copy protection are incompatible. Protected software is difficult to load and use on hard-disk systems. Key lock and code identification systems are also objectionable to both users and retailers alike — to users because they are cumbersome to use and to retailers because they must stock extra parts and furnish additional end-user hand holding.

Some vendors, like Microsoft and Ashton-Tate, believing piracy is a relatively inconsequential problem, decided to put the desires of their customers first and removed copy protection from their packages. Other vendors, like Lotus Development Corp., fearful of making it any easier for pirates to copy their packages, continue to employ copy protection and are pressuring ADAPSO to formulate industrywide copy-protection standards.

Apple has also taken a hard line in legally fighting the fake Apples produced throughout Asia. This problem, of course, is different from software piracy, but there is overlap since successful hardware copying will inevitably spark software copying. Today you can buy a pirated copy of nearly any software package you wish — Framework II, Lotus 1-2-3, MS-Word, Turbo Lighting and even Xenix — in Hong Kong at 50% to 90% less than the U.S. price.

What will be the long-term effect of widespread piracy? For guidance, one can look to the music and film industries. Both proposed legislation to tax tape recorder and blank cassette sales to reimburse entertainers for lost revenue caused by copying. The entertainment industry pointed to the dire consequences of diminishing artists' incentives to perform: There would be fewer movies and recordings from which consumers could choose.

The consumer electronics industry responded by forming "Right to Tape," a well-funded lobbying group opposed to any restrictions on copying. Enactment of legislation is a long and painful process; after many years, practically nothing has happened.

Meanwhile, film studios are as busy as ever, concerts are more popular than ever, and, if there is a dearth of recordings, it is simply because the compact-disk presses can't keep up with demand. Filmmakers discovered that it was actually more profitable to sell more units at a lower price. Rarely is one priced above $29.95; two years ago, $79.95 was the norm.

### Temporary shifts

While there are differences between the audio/video and computer software markets, there are enough similarities to draw some conclusions. First, software authors will not desert the market. While they may make some temporary shifts — education to business, for example — in general, innovation will not die.

Second, manufacturers are going to reduce prices to a point where piracy really doesn't pay off. In doing so, they will be surprised at how much additional demand they generate.

Third, technology will eliminate some of the problem. Just as compact disks provided an inadvertent solution for the entertainment industry, they, or another device, are likely to solve some of the piracy problems in the software industry.

My view is to forget about piracy. A free market and technology are much stronger forces and will make piracy a no-reward venture.

*Ahl founded* Creative Computing Magazine *and is the author of more than 20 books on recreational, educational and professional computer applications.*

---

## *The information business: Captivating and confounding*

**GUEST OPINION**

**By MICHAEL A. CONNIFF**

Think of yourself as a strategic planner for a hardware manufacturer, and the internal think-tank talk has turned from the annoying present — networking, systems integration, software services and desktop publishing — to the imminent future. You are now charged with dusting off the crystal ball and coming up with a clear vision of the concepts that will drive the company into the next century.

A difficult task, but, if you are IBM, Digital Equipment Corp., AT&T or even Apple Computer, Inc., you have a ready answer: information. Your company is in the business of solutions, you say, and you need to bundle your hardware and software with information services. It's nothing more than taking systems integration, networking and software services a step further.

Given the logic of such a strategy — a logic that all four found irresistible — why have all these vendors stumbled so awkwardly in the information business?

IBM took the joint-venture route with name-brand partners: International Marketnet Service, the brokerage automation joint venture with Merrill Lynch & Co., has been a dud to date; CBS, Inc., IBM's joint-venture partner with Sears Communication Network, Inc. in Trintex Co., the consumer videotex service, has pulled out of the project.

### A familiar role

DEC tried to become a publisher of compact-disk/read-only memory (CD-ROM) titles but abandoned the publishing business per se in favor of the more familiar role of supportive vendor.

AT&T tried and failed twice, first with a real-estate information service and then with a joint marketing agreement with Quotron Systems, Inc., which was discontinued when the financial quote provider was acquired by Citicorp, N.A.

IBM seems to bring its own brand of elephantiasis to the information business. DEC, a dutiful cow nudging its calves, tries to push technology along, at times to its own near-term detriment. AT&T's response to the information business is invariably Pavlovian, salivating for the T-bone steaks regulators say they can't have.

Why can't the vendors stay away? By all estimates, the information business still promises the open-ended growth now a distant magnetic memory in the vendors' past. They look at the chocolate-covered nougats like CD-ROM, consumer videotex and financial information services, and they can't keep their hands off.

Perhaps the demise of information services at Apple, where all things seem magnified, is the most instructive. Desktop publishing and desktop communications have dominated the publicity emanating from Cupertino, Calif., but Apple has also devoted resources to "desktop information."

Apple Information Services, under the leadership of an Apple vice-president, consisted of 15 people dedicated to Apple proselytization in the information industry. Apple evangelists spoke of the wonder of the Macintosh user interface as a data retrieval tool. Apple dispatched 10 people, including a business development consultant, marketing manager, director of engineering, network operations manager, software manager, vice-president, software engineer and manager of software engineering, to a small information industry conference on CD-ROM.

But there was a problem — desktop information wasn't really at the heart of their business. Apple Information Services was soon scrambling for matching funds from outside the company that would enable the unit to become a separate subsidiary — and to eventually enter the world of MS-DOS-based software.

### Disbanded and dispersed

"We almost got the money," said one former Apple employee. Times-Mirror Co., the newspaper, cable television and publishing powerhouse, almost bought in. But it was not to be. Apple Information Services has been disbanded, its employees dispersed throughout the company or dispatched in search of other non-Apple work.

If vendors observed a few simple rules, they could save their companies time and resources:

- Don't get taken in by the glamour and growth of the information business. It is a complex and confounding field, even for executives with experience under their belts.
- Resist the impulse to establish equity positions with brand-name companies just because it looks good on paper.
- Pursue strategic marketing agreements that don't encourage the establishment of an entirely new and impenetrable bureaucracy.

*Conniff is a consultant based in Burlington, Vt.*

**Continued from page 16**

making incremental "footprint" announcements in terms of system performance as we meet our three-year commitment. We are, however, just as committed to the software side of parallelism as we are to the hardware side, and will continue to place major emphasis on our operating system development.

**Kenneth H. Goldner**
Director
Industry Marketing
Encore Computer Corp.

## Classifying processing

As the article, "Parallel processing" [CW, Dec. 22], points out, there are many definitions of parallel processing. Actually, you can throw in the concepts of vector, array, multi- and matrix processors.

Unfortunately, the major problem is that people confuse parallelism in processing with parallel processors. I have an IBM Personal Computer XT microprocessor with an 8087 match coprocessor that can process simultaneously but is not a parallel processor.

I disagree with IBM that the project is a parallel processor. I feel that it actually is a vector processor. Also, I don't think the delineation should be as large a mystery as is stated. A text book called *Computer Architecture and Parallel Processing* by Hwang and Briggs presents a technical analysis of parallel and vector architectures.

They state three schemes were devised to classify computer architectures. Flynn (1966) bases his classifications on the multiplicity of instruction and data streams in a computer system. Feng's scheme (1972) is based on serial vs. parallel processing. Handler's classification (1977) is determined by the degree of parallelism and pipelining in various subsystem levels.

All of the classifications would consider the IBM GF11 processor a multiexecution unit — or single-instruction, multidata stream — vector processor. Only one instruction is decoded by one control unit at a single point in time. It is acted upon by execution units, not processors. The execution unit only carries out the single instruction. It has no control unit and therefore can't decode its own instruction.

A parallel processor would incorporate multiple processors, each of which is composed of a control unit and an execution unit. Multiple instructions would simultaneously be decoded and sent to their own execution units.

As a person who is trying to understand the subject, I will welcome all articles that are as interesting and thought-provoking as this.

**Tony Jeffcott**
Vice-President, Technology
Intech Leasing Corp.
Stamford, Conn.

## Ametek's applications

The feature story, "Parallel processing" [CW, Dec. 22], did a fine job of addressing the issues of multiprocessing, but the research into commercial vendors unfortunately omitted a number of major players, including Ametek, Inc.

Had Ametek's System 14 not been omitted from the story, readers would have learned about an Intel Corp. 80286-based parallel processor that was commercially available in 1986. Important applications in technical and commercial markets include physical simulations of heat flow, oil fields, transsonic aerodynamics and a wide variety of Fast Fourier Transfer applications.

**Al Kernek**
Manager, Marketing and Sales
Ametek
Arcadia, Calif.

## Open systems problem

I must confess that I found John L. Kirkley's Viewpoint, "Friendly vs. forward-looking: The Mac and AT square off" [CW, Dec. 22], highly amusing. "Friendly vs. forward-looking?" At least on the Macintosh, desk accessories know how to live with each other. He offered an interesting comparison — an enthusiastic user eager to show off what can be done now with a MacIntosh and an equally enthusiastic tech wizard saying, in effect, "Look what we'll have in a year or so!"

The point of contention seems to be open vs. closed operating systems. The Mac system is closed because it has few optional parts. In fact, if it even has a name, it's managed to escape me. The Microsoft Corp. MS-DOS system is open because it has a plethora of optional parts.

There's only one thing wrong with the open idea. The Mac system already has the parts needed to supply user-friendly software in a standardized graphic environment. To achieve the same thing under the IBM/MS-DOS architecture, one must first shell out enough money for graphics peripheral equipment to have bought an Atari Corp. ST or Amiga, then call the MS-DOS wizard to patch the peripheral drivers into DOS and hope the graphics applications work together. If this seems extreme, remember that MS-DOS is a direct descendant of an operating system that was intended to run on a 20K-byte, nongraphics, 8080-based microcomputer.

To the gurus, the Mac system may appear limited, but the Mac users seem to be pretty happy on the whole. They could care less about what DOS does or doesn't have, technically speaking, so long as the job gets done. If a system with an extendable, multitasking DOS with integral color graphics and a mouse is what you need today, go out and buy an Amiga.

**Tim Holloway**
Principal Associate
MTS Associates
Jacksonville, Fla.

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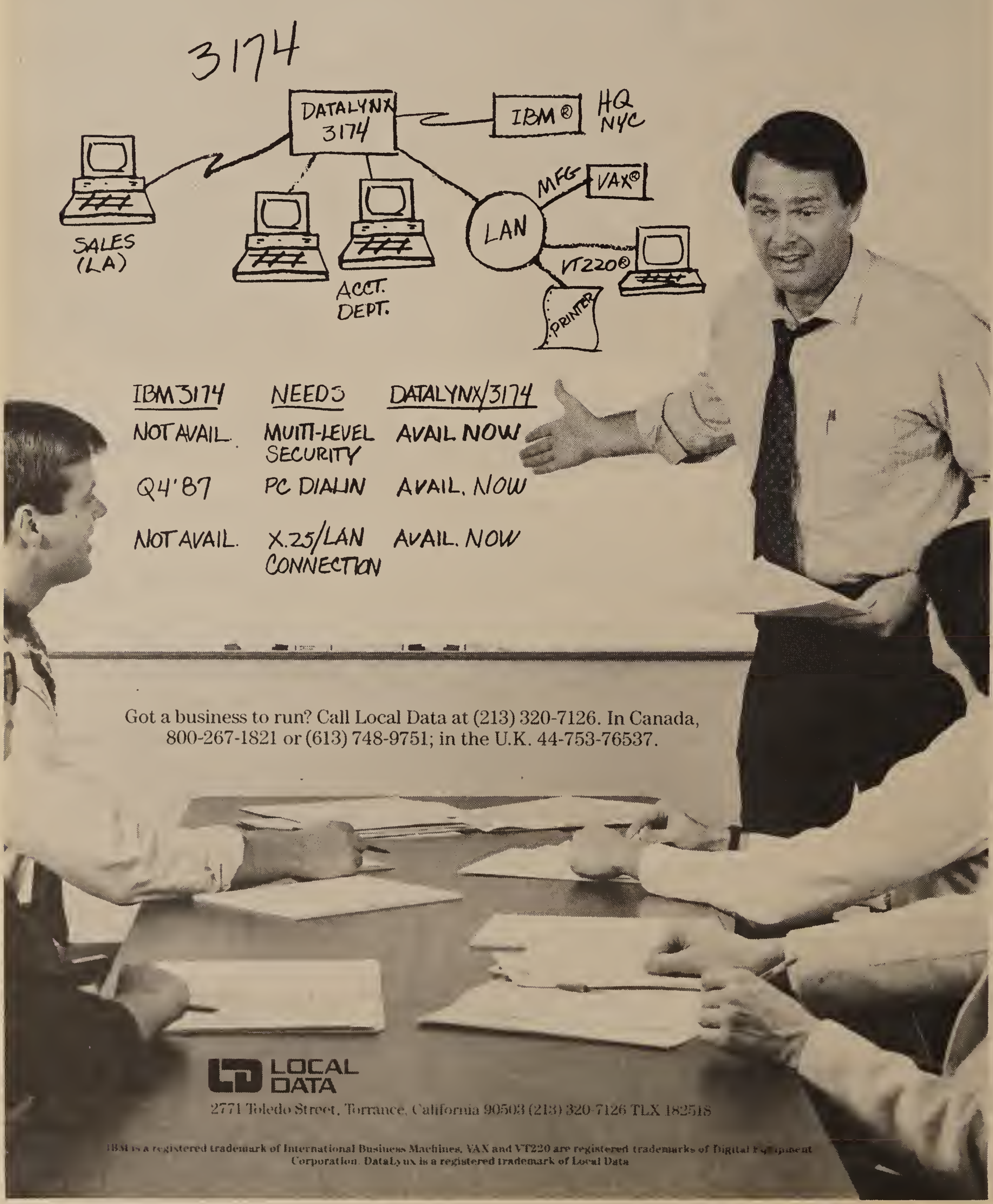

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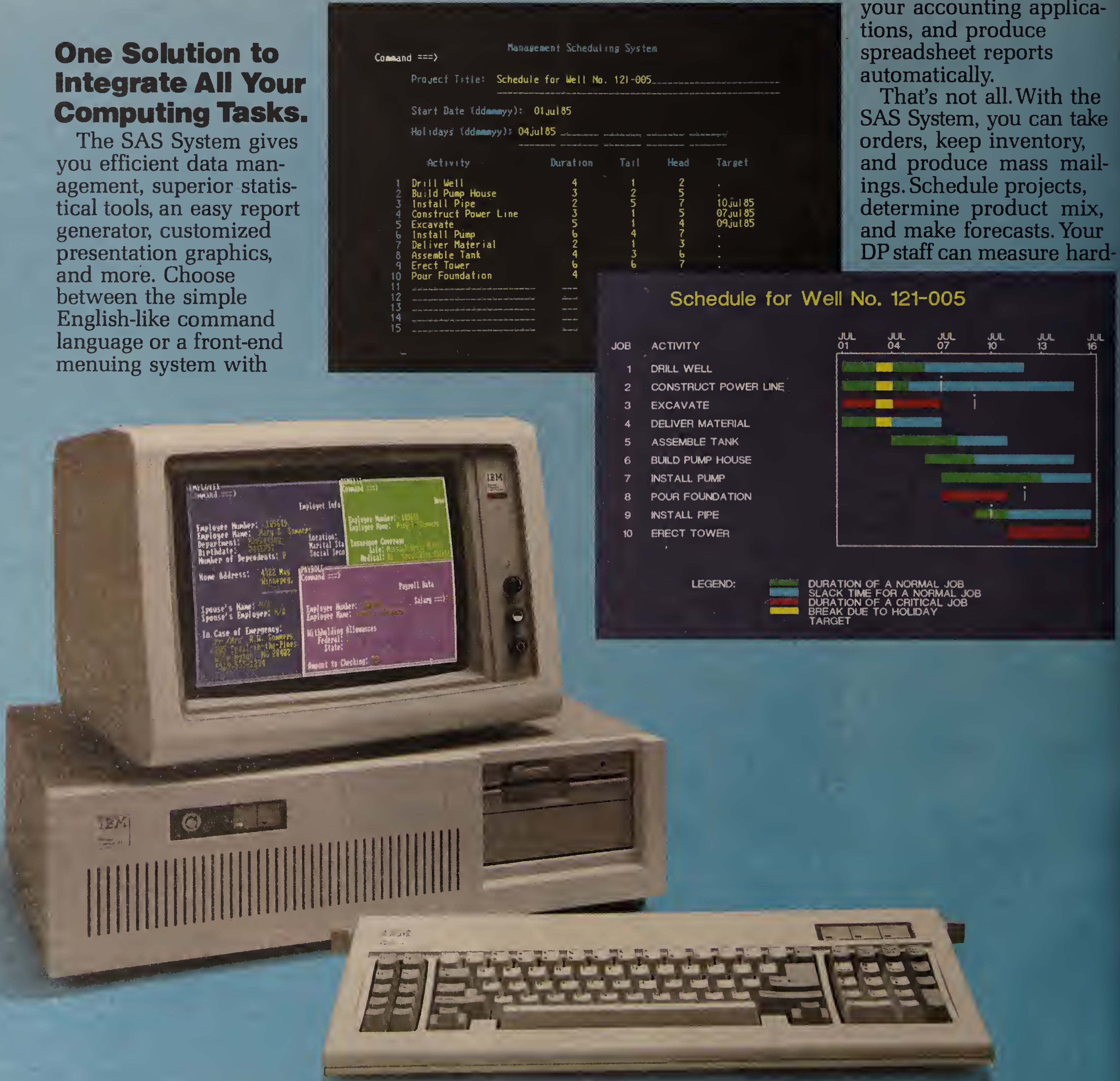

```
                      Management Scheduling System
Command ===>

      Project Title:  Schedule for Well No. 121-005________________________
                      _____________________________________________________

      Start Date (ddmmmyy):  01jul85

      Holidays (ddmmmyy): 04jul85 ______ ______ ______ ______
                          ______ ______ ______ ______ ______

       Activity                    Duration    Tail    Head    Target

   1  Drill Well                      4          1       2       .
   2  Build Pump House                3          2       5       .
   3  Install Pipe                    2          5       7     10jul85
   4  Construct Power Line            3          1       5     07jul85
   5  Excavate                        5          1       4     09jul85
   6  Install Pump                    6          4       7       .
   7  Deliver Material                2          1       3       .
   8  Assemble Tank                   4          3       6       .
   9  Erect Tower                     6          6       7       .
  10  Pour Foundation                 4
  11  ______________________________ ___
  12  ______________________________ ___
  13  ______________________________ ___
  14  ______________________________ ___
  15  ______________________________ ___
```

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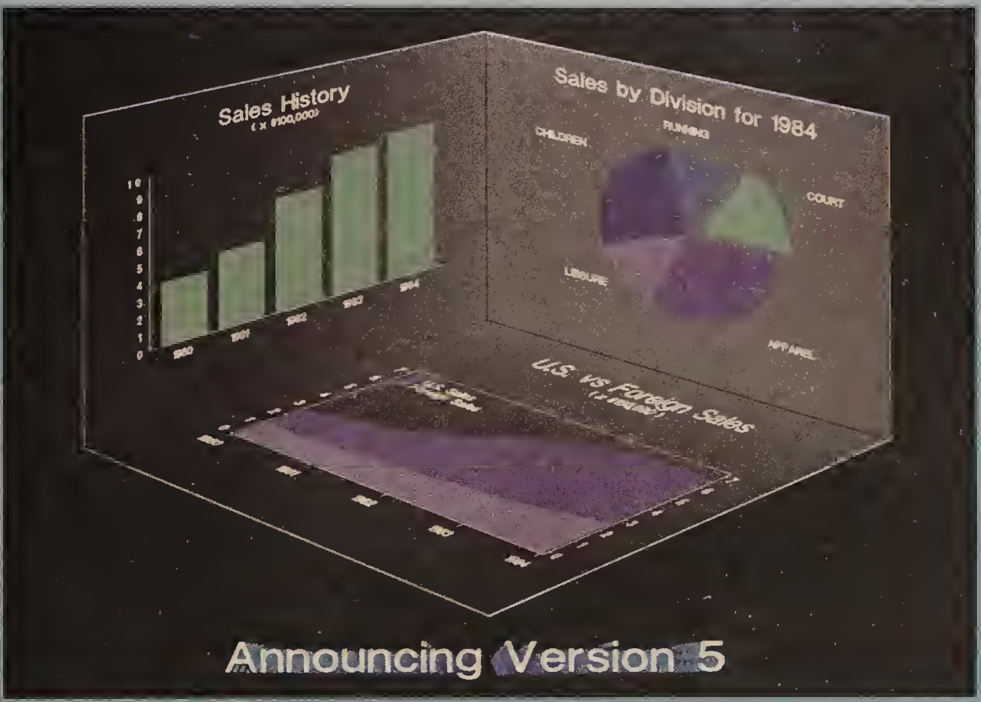

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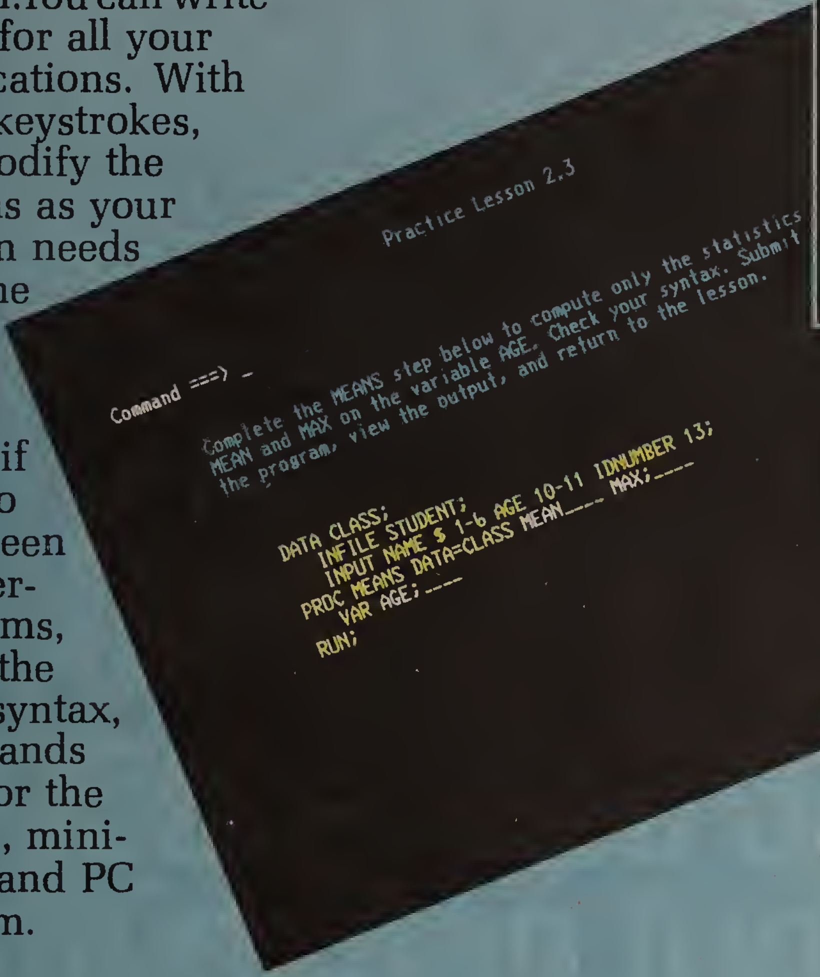
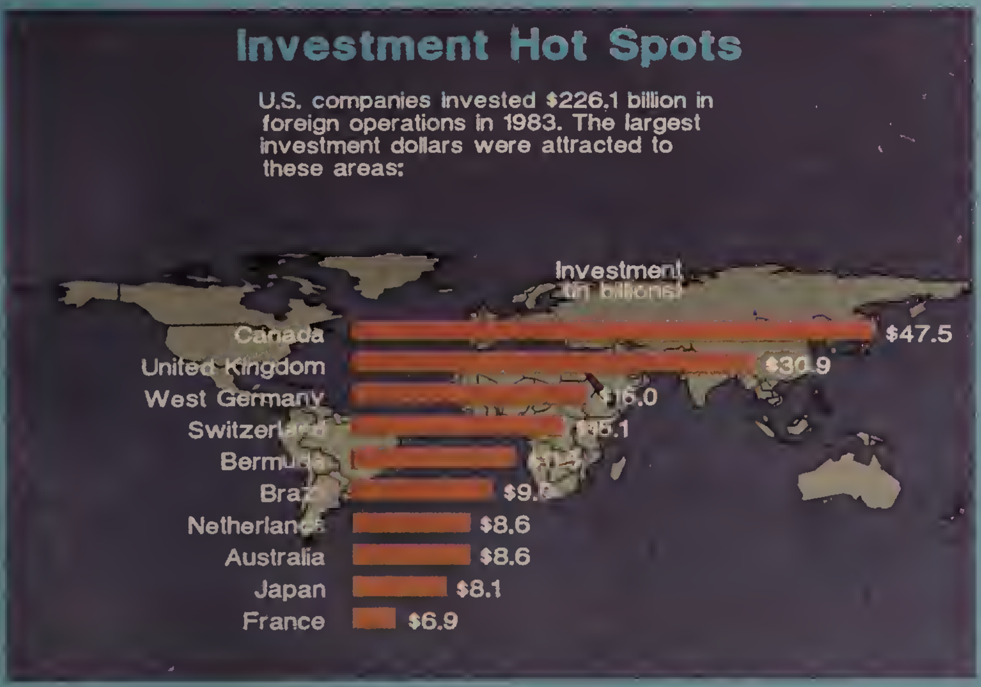


```
Practice Lesson 2.3

Command ===> _

Complete the MEANS step below to compute only the statistics
MEAN and MAX on the variable AGE. Check your syntax. Submit
the program, view the output, and return to the lesson.

DATA CLASS;
  INFILE STUDENT;
  INPUT NAME $ 1-6 AGE 10-11 IDNUMBER 13;
PROC MEANS DATA=CLASS MEAN___ MAX;___
  VAR AGE;___
RUN;
```



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# NETWORKING

**DATA STREAM**
Walter Ulrich
and Elisabeth Horwitt

## Reflections on a hectic year

The three-year period ending at midnight Dec. 31 was the most hectic in the history of the communications industry. During that time, communications managers had to learn to deal with the divestiture of AT&T and the subsequent regulatory and market confusion as competition intensified and vendors sought new fields of endeavor.

Of those three years, the last was particularly hectic. New technologies emerged. Several promised breakthroughs even became commercially available. Industry segments experienced repositioning, growth and shakeout. Users had trouble keeping track of it all. Here, in broad strokes, is the communications industry of 1986:

With profits down 12% in the first nine months, IBM had a tough year. Nonetheless, Big Blue announced communications-related products at a stunning rate. Among the most significant are PC Netview and the 9370. PC Netview could be looked at as IBM's Trojan horse: Promising a network management interface standard, it puts Big Blue in control of other vendors' telecommunication equipment.

The 9370 is part of IBM's counterattack against Digital Equipment Corp. in the departmental processor and networking arenas. Not only does the low-end system fill in an important gap in IBM's office systems strategy, but it

See **REFLECTIONS** page 25

*Ulrich is president of Houston-based management and technology consulting firm Walter Ulrich Consulting. Horwitt is* Computerworld's *senior editor, networking.*

## Multiport transceiver out

### Terminals, PCs to gain fiber-optic connectivity

**By Stanley Gibson**

ROANOKE, Va. — Fibercom, Inc. announced last week a multiport version of its Whisperlan transceiver that provides a cost-effective way for IBM Personal Computers and terminals to communicate over the company's fiber-optic-based Ethernet local-area network (LAN), according to Albert Bender, Fibercom president.

Whisperlan/MPT supports up to eight asynchronous devices at a cost of $225 per Ethernet connection, as compared with the original Whisperlan transceiver, which connects one device at a cost of $750, Bender said.

Whisperlan/MPT is not a network server on which a group of devices share access to one network connection; rather, it is a segment of a fiber-based IEEE 802.3 Ethernet: "A LAN in a can," according to Bender. This means that devices connected to a transceiver can talk to one another just through the transceiver or transmit to other nodes on the greater Ethernet LAN.

"The multiport transceiver will make Whisperlan appealing to the PC world," Bender said, adding that he believes the product will be attractive to businesses for connecting PC LANs to fiber-optic backbones.

An existing Ethernet PC network, as well as single Ethernet devices, can connect to a Whisperlan/MPT port, according to Bender.

Each Ethernet device can be located 150 feet from a transceiver.

Whisperlan/MPT is intended to work with Whispernet, Fibercom's product that implements standard 10M bit/sec. Ethernet over fiber-optic cable. However, Bender said all Whisperlan products are fully compatible with Digital Equipment Corp.'s

See **MULTIPORT** page 25

## Hybrid cabling system debuts

**By Patricia Keefe**

MORTON GROVE, Ill. — Taking its cue from IBM, AT&T and Digital Equipment Corp., Northern Telecom, Inc. introduced its version of a uniform building network wiring scheme employing a combination of fiber-optic cable and standard twisted-pair wiring.

Called Integrated Building Distribution Network (IBDN), the Northern Telecom scheme is similar to those of its competitors. "Let's face it, the wire topology and basic connection technology is set by the 100-year-old telephone network," said Robert Newton, program director of local-area communications for the Gartner Group, Inc. in Stamford, Conn. During the next five to 10 years, he predicted, building wiring schemes will move toward fiber-optic only.

The building wiring schemes, according

See **HYBRID** page 24

## Comsat, ITT unveil overseas satellite links

**By Elisabeth Horwitt**

ITT World Communications, Inc. in Secaucus, N.J., and Comsat International Communications, Inc. in Washington, D.C., have announced what reportedly are the first digital satellite-based overseas services between the U.S. West Coast and the Pacific Basin countries.

ITT's Worldsat service, unveiled earlier this year, now offers satellite-based connections between the U.S. and "any country served by Intelsat Business Service," said Beth Enrich, Worldsat product manager. Intelsat Business Service is a consortium of European carriers offering international satellite-based services.

Worldsat offers links between the West

See **OVERSEAS** page 24

### INSIDE

First field trial of the ISDN primary rate interface begins/**24**

### NEW THIS WEEK

- Server Technology offers Netbios-compatible version of its Easylan network software
- For more on this and other new products, see pp. 59-62.

### INSTANT ANALYSIS

*"Everyone and his brother is trying to say that what his company is doing is Open Systems Interconnect."*

**— Vick Boersma, manager, technical requirements, technology and standards, Northern Telecom, Inc.**

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# Overseas satellite links unveiled

From page 23

Coast and either Europe or the Pacific Basin and between the East Coast and Europe. Comsat, which already offered East Coast-to-Europe services, recently added a West Coast-to-Far East offering. Customers in other parts of the country will be able to access the Far East gateway in San Francisco through Comsat's domestic network, according to Eric Novotny, Comsat director of new business development.

Both ITT and Comsat are implementing coast-to-coast terrestrial links to supplement domestic satellite-based connections. A terrestrial link is necessary for data and voice communications applications that cannot tolerate transmission delays that occur during the double satellite hop needed for an East Coast-to-Far East connection, for example, Novotny explained.

Comsat's West Coast-to-Far East services will offer rates comparable to the U.S.-to-Europe offerings, Novotny said. Typically, a 56K bit/sec. line between the East Coast and a European country costs $5,000 per month for Comsat's portion of the link and approximately the same amount for the European carrier's portion.

ITT charges $4,250 per month for its portion of a 56K bit/sec. or 64K bit/sec. overseas link.

Both Comsat and ITT's overseas offerings are based on the Intelsat Business Service. Both support digital transmissions of voice, data, video and facsimile at rates of up to 1.5M bit/sec. or 2M bit/sec., depending on the variety of T1 standard available in the destination country.

# Hybrid cabling system debuts

From page 23

to Newton, are loss leaders for switch makers hoping to sell equipment to users. "All the people who sell structured wiring systems are basically losing money on it," he said, adding that money is made on the installation of cable.

The hybrid cabling system used in Northern Telecom's IBDN allows terminals and computers to communicate with each other exactly as they would over coaxial cable with no degradation in speed, according to William J. Viviano, vice-president and general manager of Northern Telecom's Cook Electric Division, a telephone equipment and peripheral computer products firm.

Under the IBDN plan, twisted-pair wiring up to a distance of 2,000 feet would support a Northern Telecom Meridian SL-1 integrated services network with a distribution speed of 2.56M bit/sec. A combination of twisted-pair and signal converters would be used to accommodate such systems as IBM's 370 at 2.35M bit/sec. and System/34, 36 and 38 at 2.4M bit/sec.

The plan also includes software enhancements for planning, engineering and cable management.

# GTE, Mountain Bell test ISDN primary rate

**By Elisabeth Horwitt**

PHOENIX — GTE Communications Systems Corp. and divested Bell operating company Mountain Bell last week began what reportedly is the first field trial of the Integrated Services Digital Network (ISDN) primary rate interface.

The primary rate defines 23 64K bit/sec. channels plus one 64K bit/sec. or 16K bit/sec. D channel that carries signaling information. It was designed to link digital private branch exchanges, communications processors and other devices that perform high-volume communications, according to Mountain Bell spokesman Robert Meldrum.

The trial involves the transmission of digitized voice and data between a GTE central-office digital switch at a Mountain Bell office in downtown Phoenix and a private-network switch located at GTE headquarters in North Phoenix, about 13 miles away. The use of fiber-optic cable connections between the two sites allows transmission over that distance, Meldrum said. Other site trials have involved distances of only a few miles, he added.

## 'Using ISDN to streamline'

GTE and Mountain Bell will be participating as ISDN customers during the trial, using ISDN primary- and basic-rate interfaces as part of their internal communications systems. "From our perspective, we're using ISDN to streamline our communications," Meldrum said. The trial is one of six scheduled for this year by regional holding company U.S. West.

The next site trial planned by U.S. West, scheduled to start in February, will be an internal test involving five Mountain Bell locations in the Denver area, according to Meldrum. The trial will test ISDN networking over a digital adjunct switch attached to an ordinary analog central office switch.

Other ISDN trials have used digital switches, "but most central office switches out there are analog, and it would be too expensive to convert to all digital; so this is an important test," he added.

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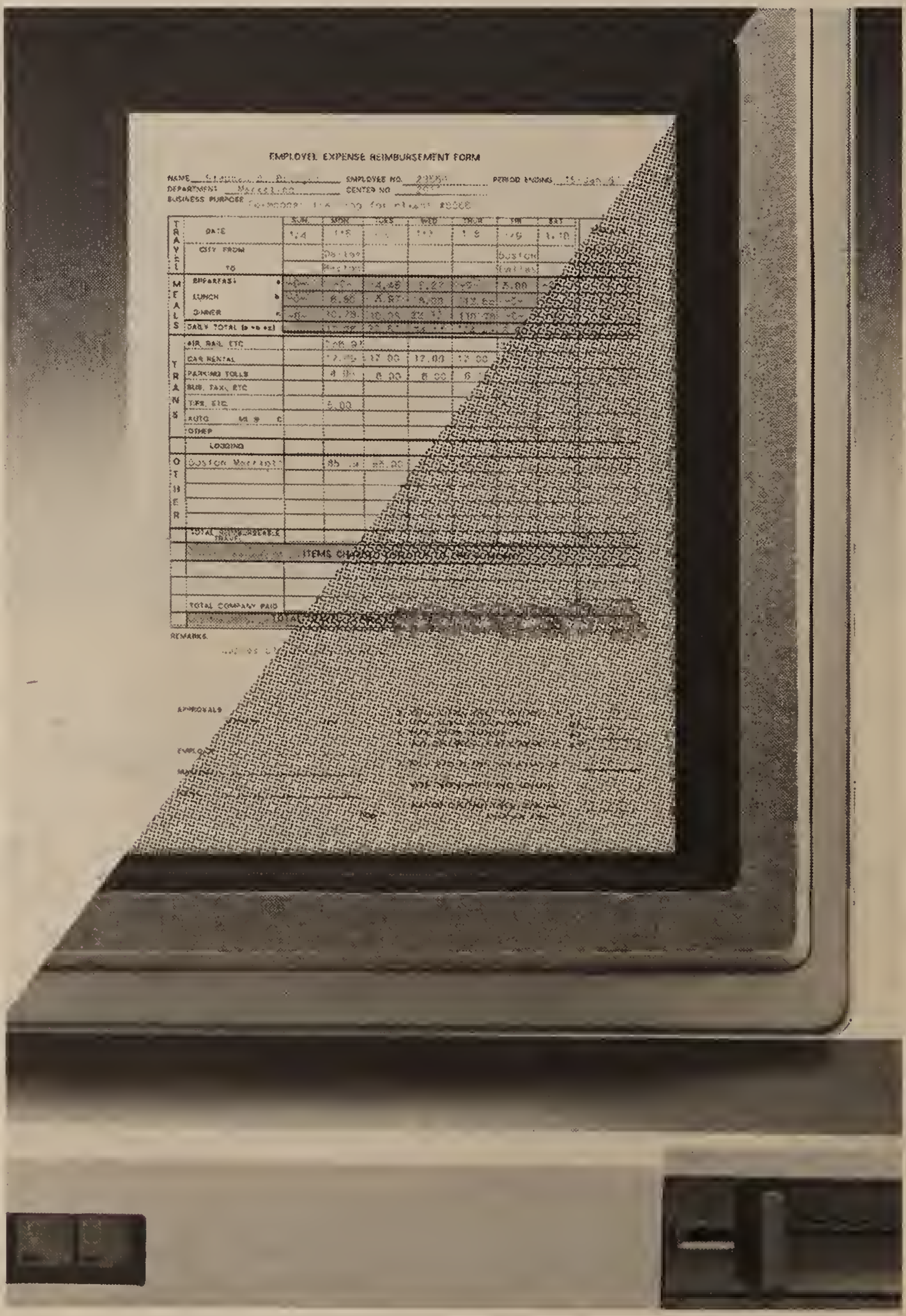
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# Reflections on a hectic year

From page 23

is also the first IBM host to directly support non-IBM communications protocols such as Ethernet and Transmission Control Protocol/Internet Protocol.

IBM's joining the Corporation for Open Systems was another strong sign that the company will not stand aloof from the standards evolution.

Superior financial performance plus a string of solid product announcements made DEC the darling of the financial analysts and the consulting community. Major DEC networking announcements in 1986 included centralized network management tools and better integration of the IBM Personal Computer with the VAX VMS environment through the Vaxmate. DEC also took the lead in Open Systems Interconnect (OSI) support, completing its seven-layer OSI suite with an X.400 electronic mail interface.

### Supporting major architectures

Wang Laboratories, Inc., Hewlett-Packard Co., Data General Corp. and the rest were not far behind in announcing support of the two major communications architectures: OSI and IBM's. The announcements of LU6.2 support have been deafening, but users still await real applications that will make peer-to-peer networking under Systems Network Architecture a reality.

With the merging of Sperry Corp. and Burroughs Corp. into Unisys Corp., the obvious next step will be the integration of the two vendors' product lines.

AT&T did a great job on communications technology but has fared poorly in the marketplace. At the end of the year, AT&T announced a $3.2 billion write-off and the elimination of more than 27,000 jobs. Of course, AT&T's major competitors, MCI Corp. and U.S. Sprint Communications Co., also announced write-offs and/or losses last year and are clearly feeling the pressure of AT&T's rash of rate cuts.

### FCC eased up

The Federal Communications Commission eased up considerably on AT&T and the divested Bell operating companies. AT&T Communications and Information Systems divisions now can jointly market and support their products. AT&T and the regional carriers now can use one accounting system for regulated and nonregulated ventures, provided they can satisfy the FCC that no cross-subsidization is taking place.

Everyone talked up Integrated Services Digital Network (ISDN), and in November, the first ISDN trial was initiated in Phoenix. AT&T claims that it will offer true ISDN services this year, but subcommittees are still struggling to reach a consensus on protocols, and general availability is slated for 1988.

The time for reflection is gone. The new year is a time to put strategies in place and tactics into action. The manager who fails to play by the new and ever-changing rules of the communications game will be reading the want ads before the year is out.

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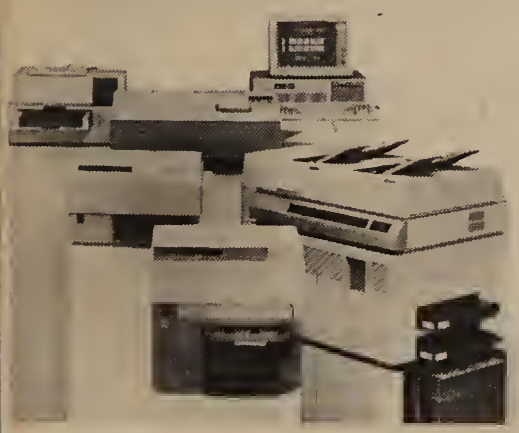

*Laser printers print the form and the information that goes on it at the same time. No one has to align paper forms in an impact printer, then burst, assemble, and collate.*

### More accurate and efficient data entry.

Electronic forms can improve the quality of data.

Data entered for an electronic form can be transferred to your mainframe. In many cases, that means you can eliminate the tedious and error-prone step where someone copies information off a paper form and enters it. The person who fills out the form has *already* entered it. Data is captured at the source, and some of the people who now do "heads down" data entry can be reassigned to more productive tasks.

### Finally, break the speed limit of paper.

Electronic forms are faster.

They can be filled in faster. The computer can automatically fill in standard information like a customer's address. When the same information goes on several pages, you enter it once; the computer puts it in all the right places. (A title company went from six sets of documents per person per day to thirty-six.)

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# Multiport transceiver out

From page 23

Decnet, Lanbridge 100 and Decconnect. In addition, he said the system works with AT&T's Premises Distribution System wiring scheme and IBM's Cabling System.

One of Fibercom's early customers, Tennessee Technological University in Cookeville, installed a fiber-optic backbone composed of eight Whisperlan transceivers to connect a seven-building campus. From each transceiver, Ethernet cable runs to DEC Delni boxes and from there to DEC terminal servers.

The Whisperlan/MPT replaces the DEC Delni and single-port Whisperlan in configurations such as the one described above, according to Kevin Hamilton, Fibercom applications engineer. The Delni is an eight-port concentrator to which eight Ethernet devices can connect.

A possible drawback of the network is that network operations are interrupted each time a node is added. However, network switches and multiport transceivers can be installed strategically so that nodes can be added as work-area networking needs grow, Fibercom's Bender said.

Among the advantages offered by the network are greater maximum distances between nodes and the elimination of repeaters that are necessary components of coaxial cable-based Ethernets, Bender added.

Fibercom may introduce Manufacturing Automation Protocol or IEEE 802.5 token-ring transceivers in the future, according to Bender.

Whisperlan/ MPT costs $1,800 and will be available for shipment in 60 days. At $1,800 per node, eight devices can connect at $225 each. A single-port Whisperlan costs $750.

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## 1986 and 1987 Digital Review Target Award Winner

# SOFTWARE & SERVICES

**SOFTALK**
Charles Babcock

## Restructuring roundtable

In the debate on Cobol restructuring that took place recently in Chicago, it was clear that certain benefits accrue to those who take the restructuring approach.

. Restructuring amounts to constructing a heirarchical or tree-like structure out of the tangled Cobol that sometimes travels under the epithet spaghetti code. A restructuring program will analyze the application, eliminating recursive logic, premature exits or backward jumping loops. The aim is to get a program that functions the same as an unstructured program but is much easier to read and maintain.

IBM endorses the concept of restructuring and has issued its own product, Cobol/SF, but it only works on VS Cobol II, a thinly installed version of the language. IBM refused to send a speaker to the debate because it was being videotaped, according to a spokesman for the organizer, Peat, Marwick, Mitchell & Co.

While there was agreement on the benefits of restructuring, there was little agreement on approach. At times, it seemed as if the contrast evident in the personal style of the three debaters was carried through to the products they had written as well.

Eric Bush, the young and professorial chairman of Language Technology, Inc., showed the surest wit and evinced the most cerebral approach to restructuring; at times, it seemed as if the oversize mustache on Bush's face was just one more sign of his determination

See **RESTRUCTURING** page 28

*Babcock is* Computerworld's *senior editor, software & services.*

# ADR updates 4GL offering

## Claims improved speed, throughput, CICS activity

**By Charles Babcock**

PRINCETON, N.J. — Applied Data Research, Inc. (ADR) has announced the third release in 17 months of its fourth-generation programming language, Ideal, claiming it offers a 25% performance boost.

The claimed performance improvement comes on the heels of a 35% performance increase cited by ADR in the previous release last April. Users of the IBM CICS application-oriented fourth-generation language, such as L. L. Bean, Inc. of Freeport, Maine, claimed a gain of as much as 65% in execution time with that release. Together, the two releases reflect a 100% improvement in system throughput, according to Joseph W. Farrelly, vice-president for research and development at the mainframe systems house, located here.

A spokesman for ADR said the performance improvement stemmed from shortening the instruction path for the parts of the language that were most consumptive of machine resources, improving its ability to interact with the CICS environment and reducing I/O requirements.

Farrelly said Release 1.4 puts compiled Ideal programs and panel definitions into operating system load modules rather than Ideal's own library. The load modules have been link-edited and can be managed directly by CICS, reducing the amount of communications needed between Ideal and CICS, he added.

Farrelly said response time has been improved 20%, CPU utilization reduced 15% and temporary storage I/O cut 25%. The three combined yield an overall 25% gain in system throughput, he explained.

In addition, Release 1.4 incorporates commands that let a user automatically distribute an Ideal report over an ADR/Email network. Although the number of ADR/Email users is limited to 282, Farrelly said ADR thinks the importance of electronic mail will grow and that Ideal's usefulness is enhanced with the commands.

See **ADR** page 28

# Users unsure of windows standard

**By Rosemary Hamilton**

While applauding their vendors' efforts to offer a standard windowing environment, some workstation users said last week they are not yet certain that the windowing system chosen, X Windows from MIT, would be their choice.

"It's nice that the manufacturers are actually agreeing on what could be a standard," said Mark Plotnick, a member of the technical support staff at the AT&T Bell Laboratories facility in Murray Hill, N.J. However, Plotnick said his department plans to evaluate both the X Windows system and the recently introduced Network Extensible Window System (NEWS) from Sun Microsystems, Inc.

"I haven't heard much about the vendors' announcement, but it sounds very nice," added Chuck Royalty, a technical staff member at Boeing Computer Services Co. "Assuming we adopt X, it would help the whole spectrum of things by letting us use software in other places."

Earlier this month, the major players in the technical and engineering workstation market — with the notable exceptions of IBM and Sun — announced a campaign for a standard windowing system. The group, which includes Digital Equipment Corp., Hewlett-Packard Co., Apollo Computer, Inc. and Data General Corp., said it intends to push for acceptance of X Windows as an international standard. By doing so, the group contends, there would be a standard environment in which windows could be displayed and to which applications could be written.

IBM did not participate, although a spokesman said the vendor is pursuing X Windows development efforts.

Some users said they will continue to review alternatives to X Windows. Tom

See **USERS** page 28

### INSIDE

Unisoft package supports Berkeley and AT&T Unix/**29**

DEC broadens its Baseway sales/**29**

### NEW THIS WEEK

- Interleaf offers Release 3.0 of its Technical Publishing Software
- Prime releases its implementation of Common LISP
- For more on these and other new products, see pp. 59-62.

### INSTANT ANALYSIS

*"VM was supposed to be a bridge to MVS. But VM has so much flexibility that some companies in the VSE world are turning to VM instead of MVS. That is something that IBM didn't fully anticipate."*

**— Donald W. Sullivan, general manager, Uccel Corp. VSE Systems**

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**Oracle launches ALLIANCE program for software VARs**

Oracle Corp,. supplier of the ORACLE distributed relational DBMS and application development tools, has announced a new program for software value-added relicensors dubbed the Oracle *Alliance* program. The program offers broader markets, simpler, faster selling cycles, and shorter time-to-market for VARs who build or convert their applications to use Oracle's products.

According to Larry Harman, Oracle's Director of the VAR program, "We offer major business benefits to VARs who choose to use ORACLE with their products. Chief among these benefits is ORACLE's portability and the portability of ORACLE-based applications, allowing applications and data to be shared among different machines. Oracle also provides the link software to exchange database information among the different machines."

**Broader VAR Markets**

ORACLE runs on the widest array of hardware: IBM mainframes under MVS and VM, most vendors' minis under both proprietary and UNIX operating systems, and PCs under MS/DOS. Oracle also developed SQL/RT, marketed by IBM on the RT PC.

Harman states, "Only with ORACLE can an application developer produce software on one system and *inherit* a vast market of users of multiple vendors' hardware. Basically, we let our software VARs do *blindfold selling*."

**"Blindfold Selling"**

The company described "blindfold selling" as the ability of a VAR's salesman to walk into an end-user site blindfolded and say, "I don't know what types of hardware you're using, or how many types there are, but my applications run on all of them."

Harman points out that VARs have a tough decision to make concerning what hardware to implement on. With ORACLE, that decision needn't be made. Software VARs who establish a niche in a particular vendor's install base can take advantage of ORACLE's portability to sell in other hardware environments.

**Shorter Time To Market**

The company also cited the high level of productivity offered to VARs by Oracle's broad range of application tools, including a forms system, integrated spreadsheet, graphics and other tools. These yield development and maintenance efficiencies that translate into shorter time-to-market and lower costs.

And, Harman adds, "ORACLE is the most complete and mature SQL-based DBMS on the market. SQL is becoming a national standard, so developing applications with an IBM-compatible, portable DBMS makes business sense in both private-sector and public-sector markets."

Harman concludes, "Generous discounts plus support, training and co-marketing combine to make the Alliance program an outstanding opportunity for software VARs."

Oracle Corporation, founded in 1977, builds and markets the ORACLE distributed relational DBMS, 4GL and DSS tools. ORACLE was the first commercial SQL-language DBMS, and is compatible with IBM's DB2 and SQL/DS DBMSs.

ORACLE provides a standard software environment across a wide range of computers and operating systems, including IBM mainframes, minicomputers from DEC, DG, ATT, HP, Stratus, IBM, Apollo and many others, and IBM PCs. ORACLE runs with IBM's MVS and VM/CMS, DEC's VAX/VMS and DG's AOS/VS among others, as well as with UNIX on most systems.

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# Restructuring roundtable

From page 27

to impose a new order on the way things might have looked in the past.

His product, Recoder, takes the most radical approach to restructuring, according to observers familiar with all three products.

Recoder is capable of breaking paragraphs in the program apart and reassembling them in a more logical order, sometimes creating paragraphs with new or replicated code to maintain a consistent logical path through the program.

W. Henry Morgan, vice-president of Group Operations, Inc., was a middle-aged gentleman with a practical, worldly air about him that could have been worn equally well on a favorite uncle or kindly Chicago ward heeler.

### First to market

His company was the first to bring a restructuring product to market and Group Operations sits on a sizable lead over its competitors in terms of Superstructure's installed base.

Morgan frequently assured his listeners that a program looks more like the original after going through Superstructure than what emerges from competing products, a claim that might seem dubious to those who seek dramatic improvement.

Nevertheless, it addressed one of the hidden issues in restructuring, the threat to maintenance programmers that an old, familiar program will be run through a Cuisinart-type process and emerge as an unrecognizable puree.

### Allow programmers to compare

Morgan urged that maintenance programmers be allowed to compare the output of all three products before a purchase decision is made.

The third protagonist was J. Cris Miller, a principal of Peat Marwick's Catalyst Group in Chicago and author of Structured Retrofit.

Miller was nattily attired in a three-piece suit, and his responses grew in forcefulness as he found his footing in front of the large audience.

He also appeared to be under the most pressure and most determined to uphold the company flag at all costs.

His product fell somewhere between Language Technology's and Group Operations', observers familiar with Retrofit said.

### One user's analysis

One observer, who has evaluated all three products, was struck by the appearances of the speakers and offered the following analysis of how each company will fare.

"If the decision is going to be made by top management, then Bush, with his intellectual approach and his ability to supply numbers about the effects of restructuring, is going to win the deal.

If the decision is going to be made by maintenance programmers, they are going to be most comfortable with the Group Operations product. And if the decision is going to be made by a committee, then Peat Marwick has the best shot at it."

# ADR updates 4GL offering

From page 27

Beta-test users said one convenience of Release 1.4 is its date-field processing capability. Ideal's internal functions can define date fields to be processed arithmetically rather than requiring a programmer to "go out and call in an assembler routine," said John J. Doherty, a programmer analyst at Wheels, Inc., a Des Plaines, Ill., fleet leasing firm.

"We like it. It's a feature they should have had a long time ago," said another beta-test spokesman, Ron Linehan, manager of systems development at the National Academy of Sciences in Washington, D.C.

Neither site had Release 1.4 applications in production use in order to sample whether they lived up to the claimed performance improvements. "It's very fast, from what I can see of how applications used to run under Release 1.3. But we haven't measured the speed," Doherty said.

Wheels is an ADR/Email user with terminals in its customers' offices. The new communications commands in Ideal will make it possible for customers to seek Ideal reports on the cost of different leasing packages, Doherty explained.

Farrelly said ADR's recent development efforts have concentrated on performance gains but that future development is likely to concentrate on added functionality.

# Users unsure of windows standard

From page 27

Wadlow, a systems engineer at the computer-aided systems division at the Palo Alto, Calif., research facility of Schlumberger Ltd., said his department has been beta-testing Sun's NEWS product and that he believes it is more technically advanced than X Windows.

IBM announced late last year the incorporation of X Windows code in its Academic Information System 4.2, the Unix-based operating system for its RT Personal Computer, which is used in academic environments.

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That translates into a binary file transfer speed of nearly 13 K characters per minute—or over six pages worth. Now imagine the impact that can have on your long distance telephone bill.

But these new modems aren't just fast, they're also versatile. They can both send and receive data asynchronously at speeds ranging from 2,400 bps down to 75 bps.

Both modems are compatible with the popular "AT" command set, as well as the IBM command set. And they have been tested for compatibility with leading PC communications software such as Crosstalk™ XVI, Microsoft® Access, Kermit, Smartcom® and Smartcom II®

# Berkeley, AT&T Unix systems supported by Unisoft package

**By Elisabeth Horwitt**

BERKELEY, Calif. — Software announced last week by Unisoft Corp. enables a wide range of hardware systems to run AT&T's Unix System V.3 operating system, as well as applications written for University of California at Berkeley Unix Version 4.3, the company claimed. The emerging Unix industry standard, Posix, will also be supported by the product.

Use of Uniplus+ System V Release 3 cuts by 20% the time it takes to implement the latest AT&T and Berkeley versions of Unix on new types of hardware, according to Unisoft President and Chief Executive Officer Robert R. Ackerman Jr. The product also offers in-house developers a way to run both Berkeley 4.3 and Unix V.3 applications on the same system.

Uniplus+ V.3 will, in the future, incorporate both Posix and the X/Open Group's specifications for a standardized Unix-based application environment, according to Ackerman. Supported by a growing number of hardware and software vendors, Posix is "98% to 99% the same as Unix," with some Berkeley Unix elements added, according to Ackerman. The Institute of Electrical and Electronics Engineers, Inc. and Unix users group /Usr/Group hope to resolve the differences between Unix V.3 and Posix and to produce a fully functional standard by year's end.

Uniplus+ Version V Release 3 incorporates Unix V.3 and Berkeley 4.3 features such as shared libraries and mandatory and advisory file and record locking.

Networking features include Transport Level Interface and Transport Provider Interface as well as Streams, which encompasses a set of tools for developing communications services within the operating system kernel. The product also includes a new release of Unisoft's B-Net, a networking system based on Transmission Control Protocol/Internet Protocol, as well as an implementation of Sun Microsystems, Inc.'s Network File System (NFS). NFS provides remote file access between different Unix systems.

Also available with the product is Unisoft's PC Interface, which enables an IBM Personal Computer to communicate with systems based on Uniplus+.

Standard Uniplus+ V.3 features include the Korn shell, one of the two major shells used with Unix V.3; full windowing capabilities; a smartboard executive; slave application processor support; power-fail recovery; and international language support. Performance is also improved through a large block-file system, which increases fourfold the number of bytes that can be read at one time.

Uniplus+ V.3 will be available in the first half of this year.

# DEC broadens Baseway sales

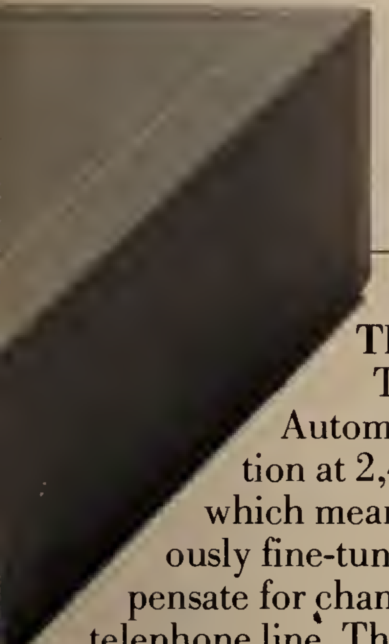
MAYNARD, Mass. — Digital Equipment Corp. recently announced that Baseway, its software development package for factory automation applications, is available to OEMs.

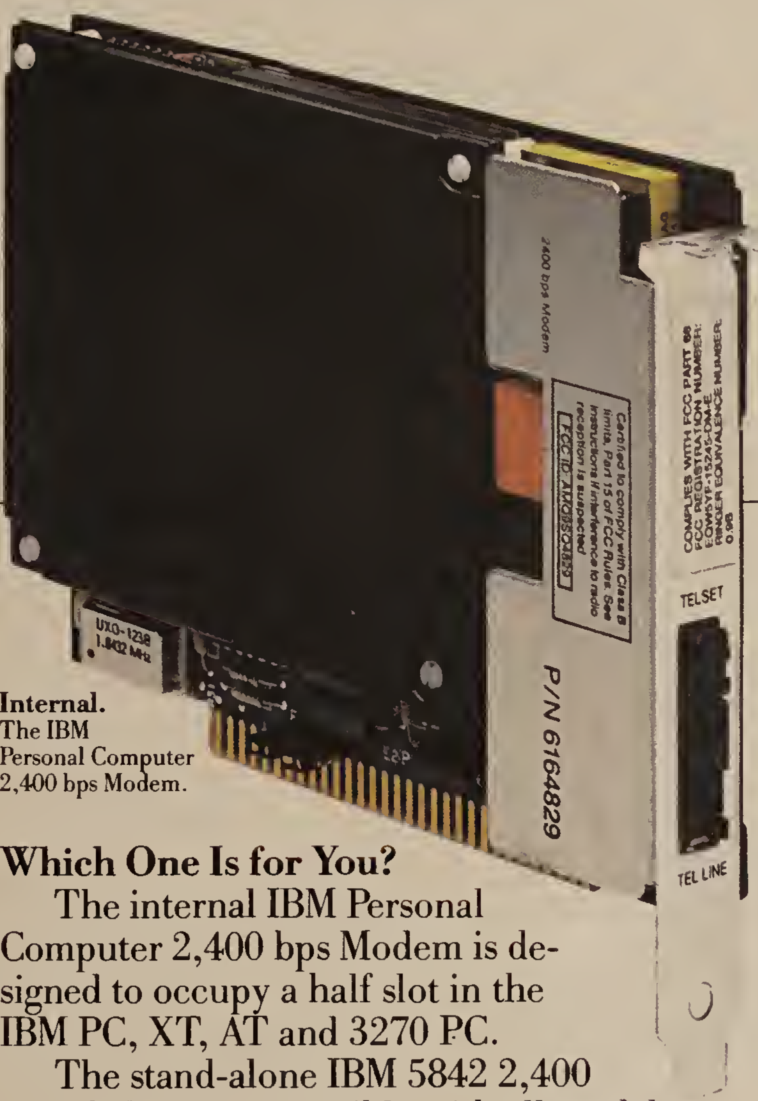
At the same time, Scientific Systems Services, Inc. in Melbourne, Fla., said it will sell Baseway and plans to market it to discrete manufacturers such as those in the automotive, appliance and aerospace industries.

Originally designed for the automotive industry, Baseway has been available to end users since 1984. The system runs under VMS.

DEC said it will sell the software separately, with prices starting at $13,000 for a Microvax II version, or as a complete package. The $100,000 package includes Baseway, a Microvax II, a PDP-11 model to act as the controller for factory floor devices and licenses for VMS and Decnet.

— **Rosemary Hamilton**





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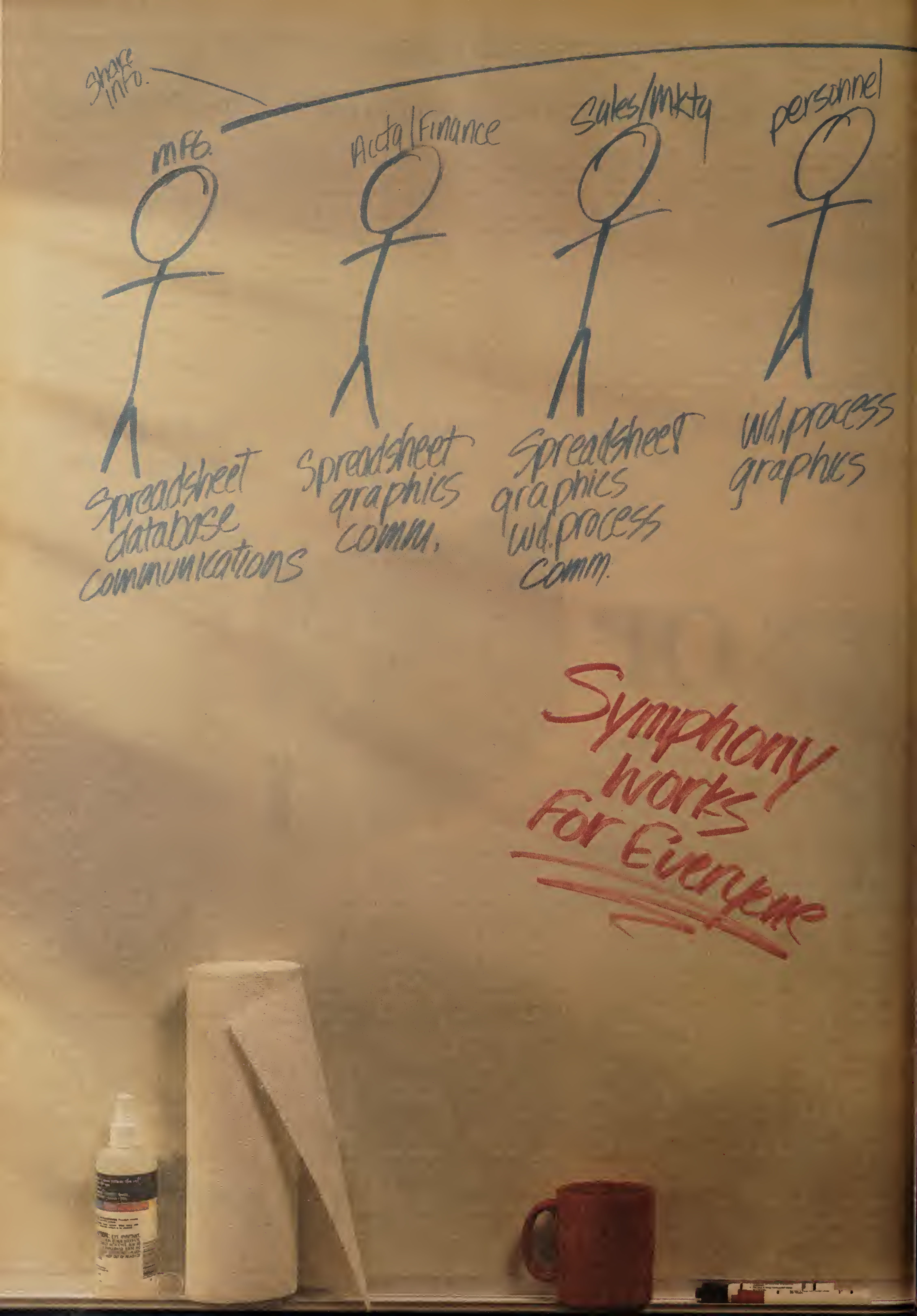
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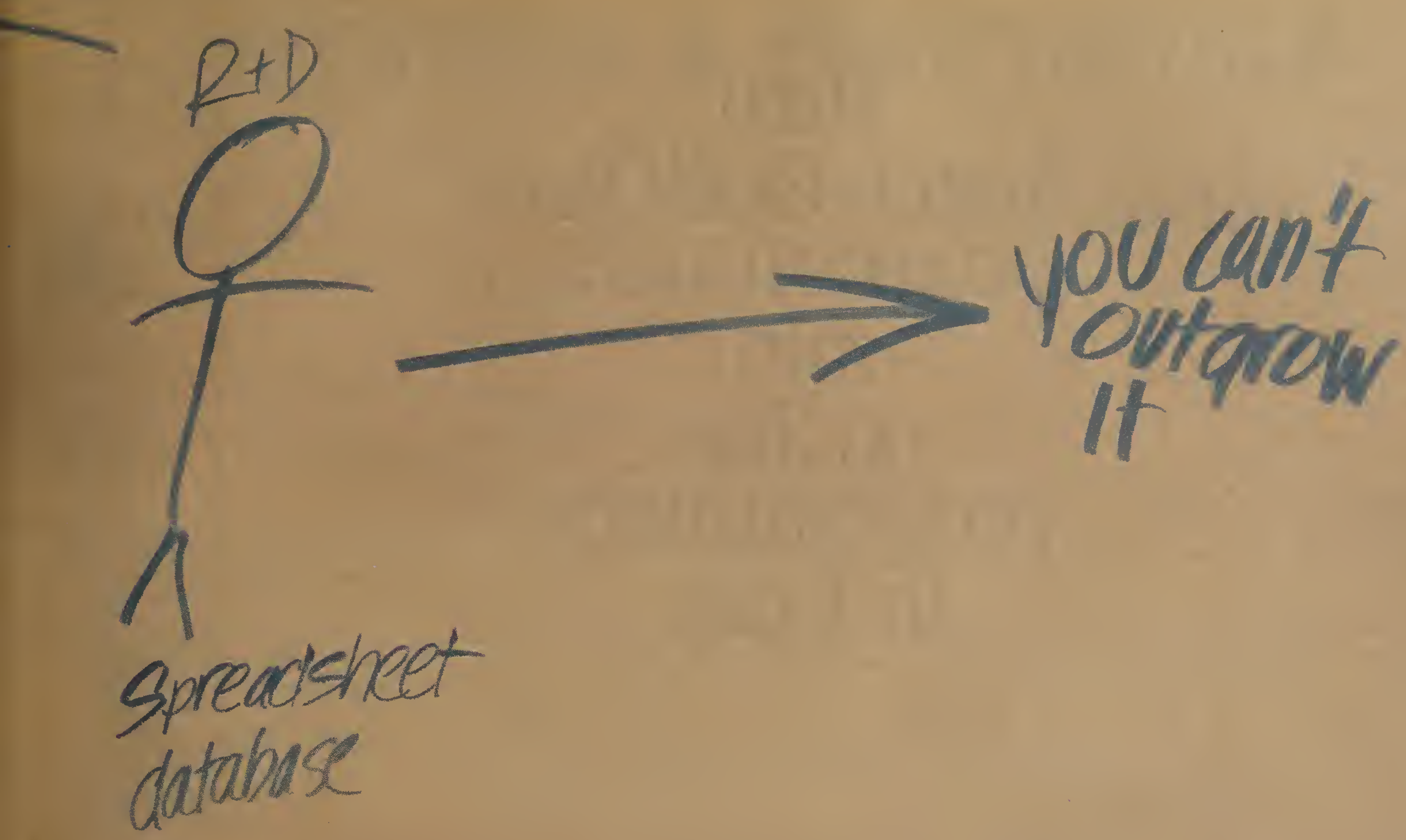

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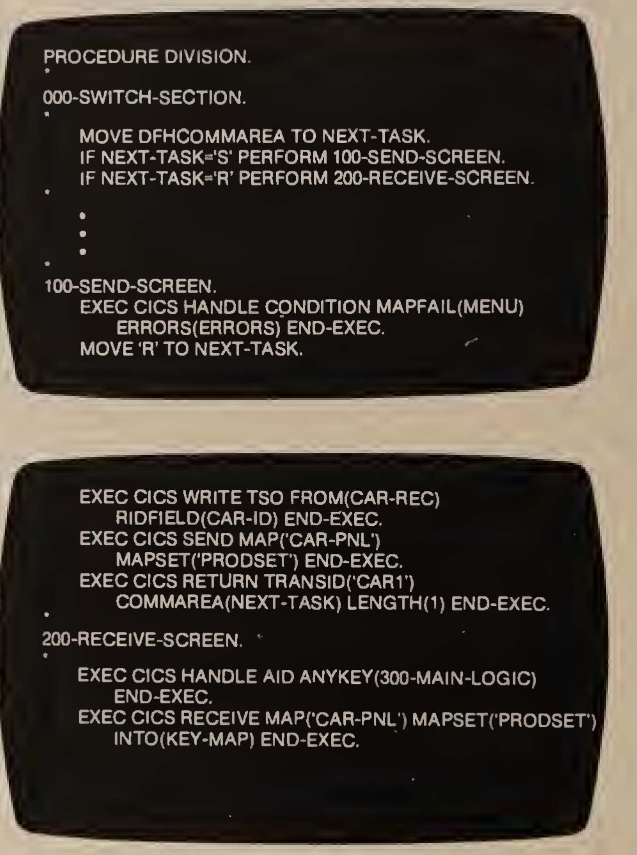
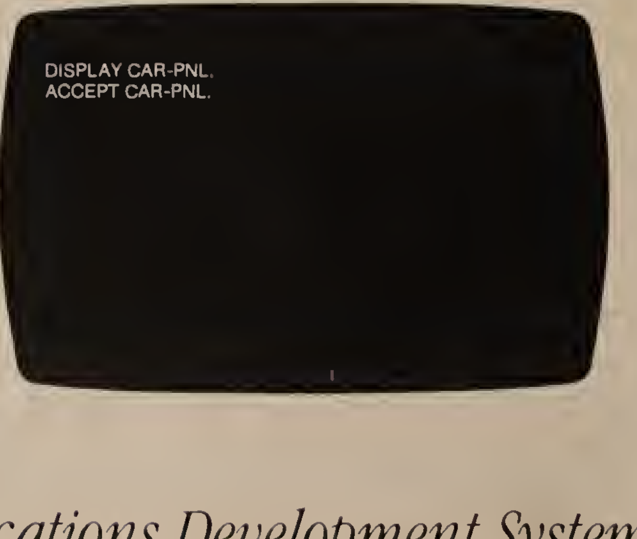


```
PROCEDURE DIVISION.
.
000-SWITCH-SECTION.
.
    MOVE DFHCOMMAREA TO NEXT-TASK.
    IF NEXT-TASK='S' PERFORM 100-SEND-SCREEN.
    IF NEXT-TASK='R' PERFORM 200-RECEIVE-SCREEN.
.
    .
    .
    .
.
100-SEND-SCREEN.
    EXEC CICS HANDLE CONDITION MAPFAIL(MENU)
        ERRORS(ERRORS) END-EXEC.
    MOVE 'R' TO NEXT-TASK.
```

```
    EXEC CICS WRITE TSO FROM(CAR-REC)
        RIDFIELD(CAR-ID) END-EXEC.
    EXEC CICS SEND MAP('CAR-PNL')
        MAPSET('PRODSET') END-EXEC.
    EXEC CICS RETURN TRANSID('CAR1')
        COMMAREA(NEXT-TASK) LENGTH(1) END-EXEC.
.
200-RECEIVE-SCREEN.
.
    EXEC CICS HANDLE AID ANYKEY(300-MAIN-LOGIC)
        END-EXEC.
    EXEC CICS RECEIVE MAP('CAR-PNL') MAPSET('PRODSET')
        INTO(KEY-MAP) END-EXEC.
```

***With COBOL/XE.*** *A pseudo-conversational task coded in COBOL/XE. COBOL/XE automatically performs the functions necessary for pseudo-conversational CICS execution simply by using the verbs DISPLAY and ACCEPT. Complex CICS code is unnecessary, and efficient execution is ensured.*



```
DISPLAY CAR-PNL.
ACCEPT CAR-PNL.
```

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# SYSTEMS & PERIPHERALS

**HARD TALK**
Stanley Gibson

## Solving the DASD mystery

In this Sherlock Holmes centennial year, it is fitting that a long-standing mystery be solved. Indeed, the denouement of a plot that might be called "The Case of the Dastardly DASD" is at hand.

In September, IBM began a program of replacing parts on all outstanding Models AO4, BO4 and AA4 of its standard 3380 direct-access storage devices (DASD), signaling the beginning of the end of a 4-year-old problem.

Difficulties with the head disk assembly that led to head crashes originally cropped up in 1983. At first, the cause was thought to be certain fungicides in computer room air-conditioning coolants that deposited tin oxide on the disk heads. Later, it was determined that the fungicides would merely speed up the development of the real problem, which was that flame-retardant chemicals, antimony and bromine, came loose from the plastic air system parts to which they were bonded.

According to Reliability Research, Inc., a consulting firm in Norwalk, Conn., the first instance of a customer being told that antimony and bromine were at fault occurred in June 1985. Even before that, however, a manufacturing change was made, altering the design of plastic air-intake parts. But not until last September, according to the firm, was an engineering change on existing head disk assemblies made,

See **SOLVING** page 35

*Gibson is a* Computerworld *senior writer.*

## Intel offers network server

### Targeted at financial, federal organizations

**By James Connolly**

HILLSBORO, Ore. — Building on the base technology of its 2-year-old System 300 series of supermicrocomputers, Intel Corp. last week announced a departmental network server targeted at functional departments in large organizations.

The Opennet Multiserver reportedly integrates equipment and functions previously available separately and features enhancements for some of those features. In addition to announcing the server, Intel officials said they plan to make processor upgrades available for the server and the 300 series in April.

The board-swap packages will allow users to install Intel 80386 processors in place of the Intel 80286. No prices for the package are available yet.

Claude Wimberly, marketing manager for Intel's systems operation, reported that Multiserver is targeted at large government and financial organizations. He claimed Multiserver is particularly well-suited to environments in which several personal computer Ethernet networks need to be linked to each other or to a minicomputer or mainframe host system.

**Single, central link**

Key features include menu-driven administration, transparent network file access, virtual-terminal capabilities for personal computers to run applications on the server and the ability to serve as a single, central link between personal computers and larger systems.

"Personal computers can now share department resources such as expensive laser printers, as well as communicate with corporate-level mainframes. The system allows users to work on files without bogging them down with having to know where the files are located in the network," Wimberly said.

The server runs Intel's version of Microsoft Corp. Xenix. It supports 140M bytes of disk storage, a 60M-byte tape backup and a 320K-byte floppy disk drive and uses an 8-MHz 80286 CPU. Prices range from $15,000 to $30,000.

## Storage Technology subsystem offers Unisys 1100 compatibility

**By James Connolly**

LOUISVILLE, Colo. — Storage Technology Corp. (STC) last week introduced a tape subsystem designed for use with Unisys Corp. 1100 mainframes or in mixed environments with Unisys, IBM and Control Data Corp. systems.

The 4700 Tape Subsystem is based on STC's existing Storagetek 4600 tape subsystem but features a greater range of compatibility with the 1100 family of mainframes produced by the former Sperry Corp. arm of Unisys.

"One of the outstanding features of the 4700 is its versatility. It can be attached simultaneously to multiple Sperry and IBM mainframes for shared access and storage capability. This tape-pooling ability is unique to the industry," said Carl Raine, STC vice-president of worldwide marketing.

Raine also said cooling, power and space requirements are reduced by 40% in comparison with Unisys products. He said the 4700 does not require raised flooring or stand-alone control units.

The controlling drive, the 4700A70, costs $47,500, and the 4700B70 costs $21,000. Both drives operate at 200 in./sec.

### INSIDE

Ibis Systems unveils a disk subsystem using Intelligent Standard Interface/**34**

Memorex adds to 3270 peripheral offerings/**34**

### NEW THIS WEEK

- Informer Computer Terminals offers portable workstation
- For more on this and other new products, see pp. 59-62.

### INSTANT ANALYSIS

*"They dug themselves a grave, but it is too soon to bury them. They are starting to claw their way out."*

**— John McCarthy, Forrester Research, Inc. analyst, on Wang Laboratories, Inc.**

## Multiple Domain Facility saves users time, cost, space

**By Jeffry Beeler**

In little more than two years, Amdahl Corp.'s Multiple Domain Feature (MDF) has worked its way into 30% of Amdahl's 580 series mainframe sites and, users say, has helped to save on software costs, unneeded equipment, systems programmer time and floor space.

Customers also cite the product's ability to allow them to run production and development tasks concurrently on one system — a practice most users normally shun.

In addition, the feature's overhead typically consumes only 2% to 3% of a system's resources, compared with at least 10% for its nearest equivalent, IBM's VM host operating system, according to customers.

Introduced in November 1984, MDF divides a mainframe into two or more discrete domains within which similar or dissimilar operating environments can run concurrently and independently. The product does in hardware for Amdahl what VM does in software for IBM.

How a processor's resources are distributed among constituent logical machines is left to the user. Moreover, customers can later shift resources from one domain to another to reflect changes in applications.

Although the product was designed to suit an assortment of uses, it has gravitated to some uses more strongly than others. In one of its more popular applications, customers reserve part of their system for IBM MVS production jobs and use the rest to convert existing programs to IBM Extended Architecture (XA).

A typical case involves National Computer Services, Inc. (NCS), a Chicago-based commercial time-sharing provider that uses MDF to create two domains in its Amdahl 5860 uniprocessor. The company supplies its clients with remote job entry, a time-sharing option and CICS services on one domain. From the other, it moves applications and customers to MVS/XA, a process that is roughly 50% to 60% complete.

The time-sharing service considered other XA conversion aids. One alternative would have been to acquire a second 5860. "But obviously, that option would have been much more expensive than using MDF," observes Paul Sarris, NCS's chief executive officer.

Also setting aside part of its MDF-equipped mainframe for a migration effort was Republic Bank Corp., a Dallas-based bank-holding company. Republic found the feature helpful during its 19-month conversion, which ended in October, says Republic Bank's senior vice-president, John Gala. "MDF greatly facilitated our conversion by allowing us to do our XA and production work in parallel during prime shifts," Gala says.

Another common MDF application is distinguished by the presence of a different IBM operating system in each logical machine. For example, Federal Express Corp.'s Colorado Springs development center houses a dual-processor Amdahl 5880 running MVS and IBM VM/CMS.

NCS and Republic Bank restrict their mainframe operating environments to MVS and MVS/XA, but Federal Express parcels its resources between MVS and VM/CMS. The 5880 supports three domains — for MVS application testing, quality assurance and system software testing — plus a fourth for VM development, according to Denis Mattingly, Federal Express's senior manager for technical services.

In a third MDF application, users maintain a uniform operating environment across all their domains but run a radically different software

See **FACILITY** page 34

# Ibis disk subsystem compatible with CDC Intelligent Standard Interface

WESTLAKE VILLAGE, Calif. — Ibis Systems, Inc. has announced a high-speed disk drive subsystem using an interface designed to be compatible with Control Data Corp.'s Intelligent Standard Interface.

The Ibis-II, based on the Ibis Model 1400 disk drive, reportedly features a capacity of 1.4G bytes and a peak data transfer rate of 12M byte/sec. The interface added to the Model 1400 was developed under a 1985 contract with CDC spin-off ETA Systems, Inc. ETA Systems and Ibis worked together in defining the requirements for the Ibis-II interface, which CDC specified in 1982.

The subsystem was designed for use with ETA Systems' ETA-10 supercomputer and Star Technologies, Inc. array processors. Star has accepted delivery of the Ibis-II, and ETA Systems installed the subsystem on the first field-test version of the ETA-10 at Florida State University this month.

The 12M byte/sec. transfer rate is intended to meet the need to transfer large blocks of data in scientific applications. The drive can be formatted in 4K- or 16K-byte sectors.

The Ibis-II with Intelligent Standard Interface-compatible interface costs $70,000.

# Memorex adds modular unit

## Rollout allows users to customize terminal

SANTA CLARA, Calif. — Memorex Corp. recently announced the 2180 modular terminal, a monochrome version of its 2180C color terminal announced last fall. Both are plug-compatible replacements for the IBM 3180 display terminal.

The terminals have a modular design that lets users customize their terminals by interchanging logic modules and keyboards. They are designed for high-volume data entry and interactive processing, according to Memorex.

The 2180 has a tilt-and-swivel monitor to adjust the viewing angle, an extra port to attach I/O accessories and light-pen support.

Users have a choice of six keyboards: three 122-key keyboard styles and three 88-keyboard styles, according to the vendor.

The terminals are available at a single-unit price of $1,995.

In addition, Memorex announced the 2173-B screen printer, which replaces the current 2173 model, offering more features at a lower price.

The screen printer features serial and parallel interfaces and full-size or half-sheet printing. The 2173-B is listed at $425 with a serial interface and $400 with a parallel interface.

# Facility saves users time, money

From page 33

subsystem within each. Memorex Corp. in Santa Clara, Calif., executes manufacturing process control systems under CICS on one side of its 5860 and standard accounting functions under TSO on the other.

"We assigned each application its own domain because CICS and TSO usually don't share environments particularly well," according to Steve Terry, Memorex's manager of corporate systems services.

Like many other users, Memorex and Federal Express used MDF to consolidate separate mainframes into one. Before installing MDF almost a year ago, Federal Express's Colorado installation operated four IBM 3033s, one for each of its four MVS and VM programming systems. The company has since transferred all activity to the 5880, Mattingly says. The consolidation translates into a 50% increase in the amount of usable data center floor space.

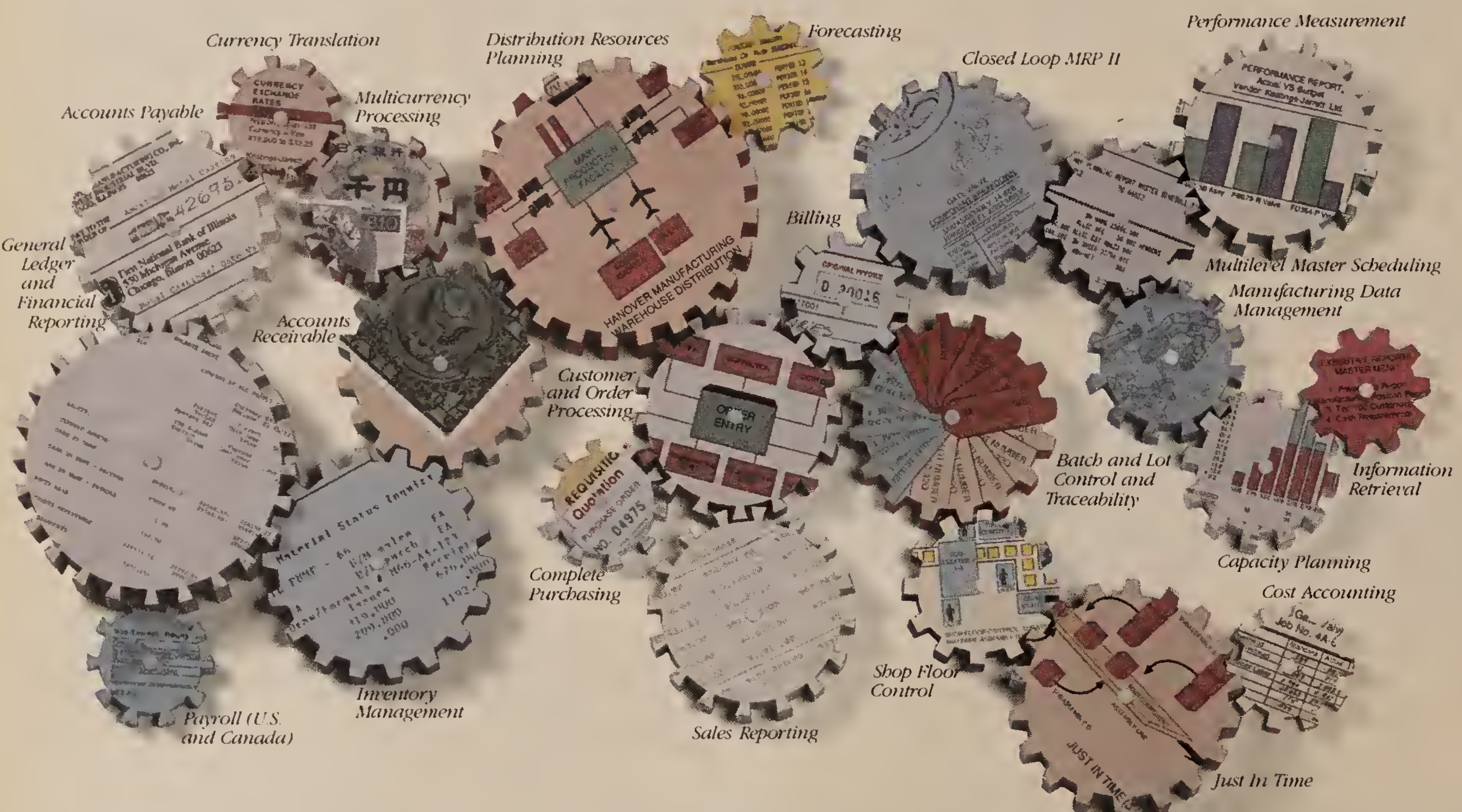
The advantages of consolidation are not limited to floor space economies, however. By cutting the number of CPUs, users can eliminate redundant operating system and program licenses and avoid attendant overhead.

During its pre-MDF days, Memorex ran manufacturing jobs on an Amdahl 470V/6 and commercial applications on a 470V/8. By moving both systems to its 5860, the storage products vendor has been able to cancel one set of licenses and use the other to control both domains.

"The cancellation has cut our software costs well in excess of $50,000 to $60,000 per year," Terry notes. Because it now operates one CPU instead of two, Memorex has also seen a decline in its systems-related utility bills.

Not all of MDF's benefits, however, are readily quantifiable. At NCS, for instance, the product has simplified life for systems programmers and, in doing so, has raised its level of customer service, Sarris says.

Until recently, systems programmers often worked nights to minimize contention for resources during the day. MDF allows development and time-sharing activities to coexist on one machine but shields the latter from development problems.



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# Solving the DASD case

From page 33

leading to the wholesale preventive maintenance that is still in progress.

From the first occurrence of the problem, it took IBM two years to discover the cause of the problem and perhaps another two years to institute preventive maintenance, which was begun well after the drive ceased production.

Now, IBM has a new generation of drives, Models D and E, and Big Blue is interested in selling these to its users. To stimulate sales, IBM is offering to replace the front HDAs (the ones susceptible to crashes) on all drives for users who have had a history of crashes. For others, IBM is performing the parts replacement so that customers may resell their units with a clear conscience.

For some users, it is a good deal to sell an old rebuilt drive and put the money toward a more powerful new one, particularly if they are taking their systems down and backing up data, to make way for the parts change or HDA replacement. If IBM had replaced HDAs earlier in their life cycle, it would merely have been an expense for the vendor. Now, it can be viewed as a stimulant to sales.

**Big Blue's bottom line**

IBM has spread the problem out over several fiscal years, so that Big Blue's bottom line has been insulated from an immediate adverse impact. In the process, users, as a group, were never told the nature of the problem until IBM had a new drive to sell them, nor were they protected by adequate preventive maintenance from head crashes, which broke out in some users' shops like small epidemics.

According to Reliability Research, a key role in resolving the problem was played by a users' bulletin board. Users exchanging notes on HDA problems were armed with plenty of information when IBM reps came calling to expound the company line on the problem.

With hundreds of messages being exchanged on this topic on the bulletin board, IBM was not amused, according to Tom Gallaudet of Reliability Research. IBM was being sent a disk of the forum's dialogues, but when the 3380 came under heated discussion, IBM asked not to be sent any more forum records, Gallaudet recounts.

Clearly, IBM is happiest dealing with each customer in isolation, on a one-to-one basis. But imagine how absurd it would seem if General Motors Corp., for example, were to become annoyed every time two Chevy owners talked with one another about their cars.

If users cannot call on Mr. Holmes of Baker Street for assistance, at least they can combine their own powers of deduction with many other managers through means such as bulletin boards and users group meetings. Few doubt that IBM is looking out for its interests. Users' interests are no less important.

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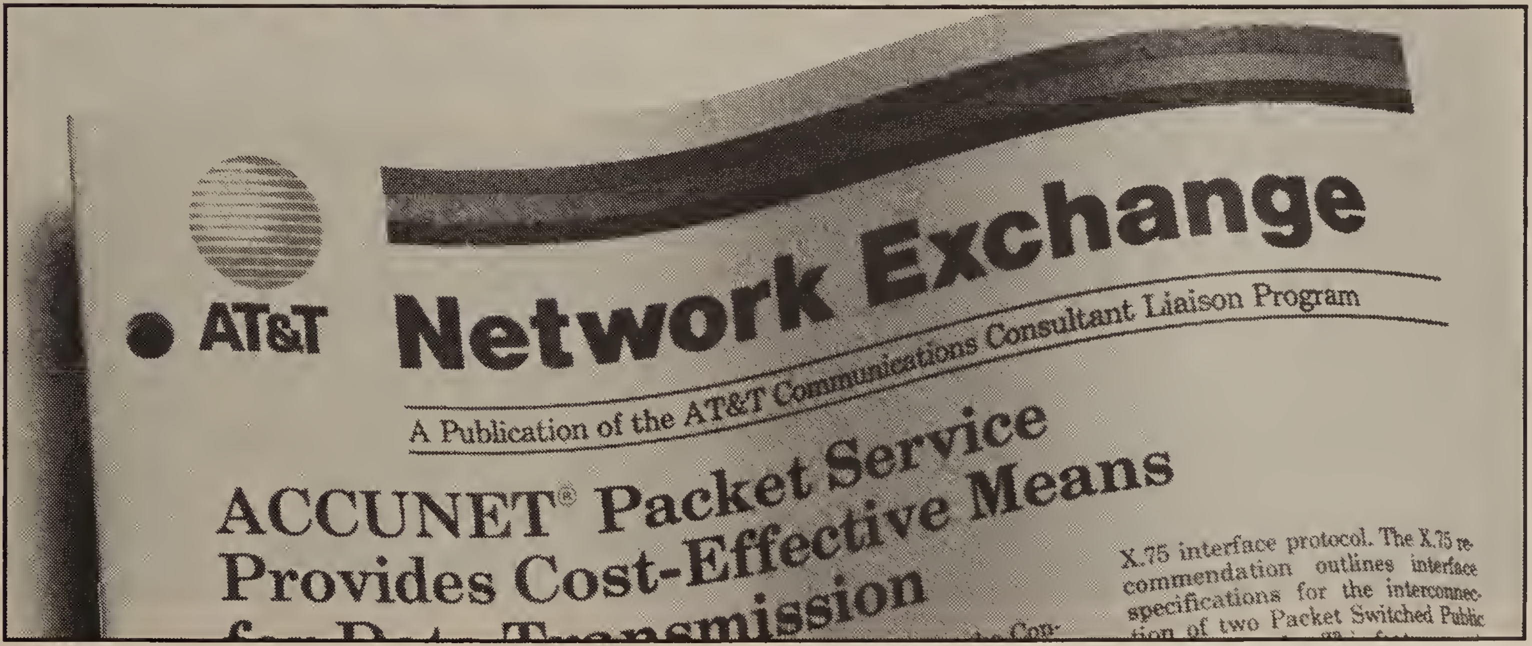

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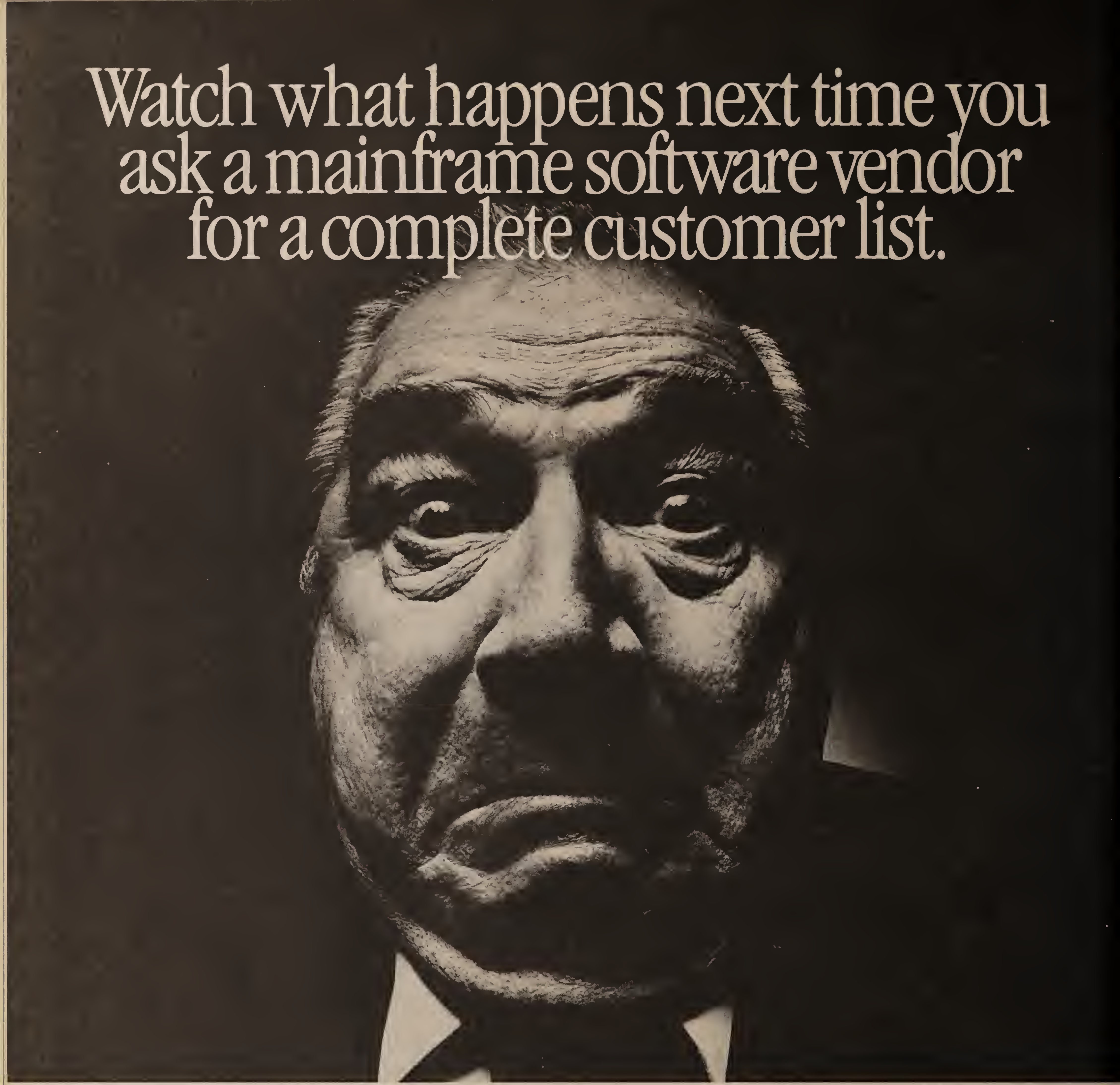
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# MICROCOMPUTING

**MICRO BITS**
William Zachmann

## Cruise control for cursors

To be honest, slow cursor movement and cursor run-on weren't problems I thought I had. So when I received a copy of Revolution Software, Inc.'s Cruise Control, it sat in software limbo, unopened, for weeks.

This ignorant and uninformed attitude lasted until I finally broke the shrink-wrap and tried Cruise Control. It is another of those ingenious utilities for IBM Personal Computers and compatible systems that, once you use it, makes you wonder how you ever got along without it.

The primary functions of Cruise Control are straightforward in both concept and execution. In the first place, it greatly accelerates cursor movement when you are using the cursor-control key on the keyboard.

A lot of applications software simply processes repeating cursor-control keys at the standard autorepeat rate of the keyboard. This can be interminably slow if you want to move the cursor a long distance, such as across many rows or columns of a spreadsheet or in a word processing document.

Cruise Control traps cursor-key presses and feeds them to the application at a rate up to the maximum speed that the application can process them. For all but a few older programs, this means cursor movement rates can be greatly accelerated.

In addition, Cruise Control lets you adjust the cursor rate to your own preference. It uses a special key in combination with others (the "5" key on the

See **CRUISE** page 39

*Zachmann is vice-president of research at International Data Corp.*

## Support program debated

### Users dispute cost, value of Ashton-Tate offering

**By Doug Barney and Peggy Watt**

TORRANCE, Calif. — Users continue to have mixed reactions to Ashton-Tate's corporate pay-for-support program, with some refusing to participate citing high prices and others saying they believe support is worth the price.

Despite the user criticism, Ashton-Tate claimed the program announced in August has exceeded expectations. "We are not into the hundreds yet, but we are moving toward the first hundred," said Karen Orton, director of services and support for Ashton-Tate. "We are not selling millions of dollars worth of this stuff, but we never intended to."

Corporate users had until the end of last year to decide whether to pay $4,000 for the corporate support plan before free corporate support runs out. For individual end users, free support expired on Dec. 1.

Many users remain uncomfortable with the new concept of paying for support. "We will never pick it up. The frustration for most users of waiting on the phone puts a bad taste in your mouth," said Bob Merkel, project engineer at Professional Control Corp. in Germantown, Wis. "When they come out with a pay plan, it is kind of a slap in the face."

Like many users, Professional Control will provide its own support. "You just have to spend more time discovering and working out the bugs yourself," Merkel said.

"We did not sign up for the Ashton-Tate program; we can't justify $4,000 and we have good internal support. That [policy] needs to be put into some licensing program," said Alan Gross, president of the Microcomputer Managers Association International, New York, and a micro manager for a firm he asked not to be identified.

Another user argued that the program has to become more flexible and less costly. "I told Ashton-Tate that I am not interested. Until it is more flexible and I can pick what I want at a reasonable cost, I won't pursue it," said a computer support manager with a large banking firm.

But other users, mainly with large corporations, argue that support is worth the price. "The contract is signed," reported Judy Galgano, manager of office automation for Grumman Corp. in Bethpage, N.Y. "We have felt in the past that we have gotten a pretty good level of support, and we

See **CUSTOMER** page 39

## Adjunct products beef up Dbase

**By Peggy Watt**

Users of Ashton-Tate's Dbase products are enhancing the powerful microcomputer data base development system by drawing from a growing selection of adjunct products.

"When Dbase doesn't do the job, we look around for something else," says Thomas G. Pantazi, systems analyst for end-user computing at Grumman Data Systems, a division of Grumman Corp. in Bethpage, N.Y. He says he prefers compatible — not replacement — products.

Like many managers, Pantazi says he has too much invested in Grumman's more than 700 microcomputers running Dbase to switch data base management systems entirely. He uses outside compilers to speed up Dbase execution and editing tools from Wallsoft Systems, Inc. to splice programming changes.

Grumman recently standardized on Alpha 3 from Alpha Software Corp. in Burlington, Mass., as a front end for Dbase data bases. "It helps the end user who doesn't know much about Dbase to handle the system," Pantazi says about the menu-driven Dbase-compatible package. "As the users grow, functionality can grow, but they can retain the architecture."

Just as the Lotus Development Corp. 1-2-3 aftermarket has spawned a selection of helper programs, Dbase supplements keep

See **ADJUNCT** page 38

### NEW THIS WEEK

- CMS offers a 60M-byte hard-drive subsystem for IBM PCs
- For more on this and other new products, see pp. 59-62.

### INSTANT ANALYSIS

*"We're trying to create mass software — for the Macintosh — for the rest of us. The programs for $400 are for the rich of us."*

**— Philippe Kahn, president of Borland International, on the Borland philosophy**

Oracle Corporation's new end-user interface, Easy*SQL, makes the ORACLE relational database management system (DBMS) instantly accessible to novice and casual users.

Oracle pioneered the SQL language with its 1979 release of the ORACLE relational DBMS. With its Easy*SQL product, Oracle becomes the first company to make a true SQL-compatible database available to users at all levels of computer literacy within an organization.

ORACLE's database facilities are available through three distinct user interfaces: Programmer interfaces; command and forms-oriented interfaces for trained end-users; and now Easy*SQL, for the large number of end users who are unfamiliar with SQL but need the benefits of a relational DBMS."

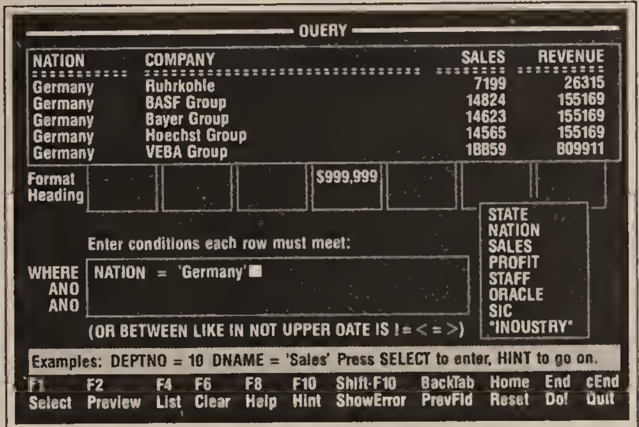
EASY*SQL: SIMPLE INTERFACES, YET FULL SQL FUNCTIONALITY

Easy*SQL's state-of-the-art visual interface includes point-and-select menus; pop-up windows (mouse support on the PC); automatic hints and context-sensitive help; ad hoc relational query capabilities; report writing, table creation and maintenance; user-selectable color graphics; bar, pie and line charts; data entry and updates using fill-in-the-blanks techniques. It even includes the Query Preview Facility.

QUERY PREVIEW FACILITY

Easy*SQL's Preview facility is one of the notable query features tailored for the novice user. During the creation of a database query, the user can press a Preview key, causing the opening of a window in which up to 5 records satisfying the query are displayed.

ORACLE'S EASY*SQL: THE 1ST NOVICE-USER INTERFACE TO THE 1ST SQL-BASED RDBMS



```
                         QUERY
NATION      COMPANY                               SALES   REVENUE
=========== ================================== ======== =========
Germany     Ruhrkohle                              7199     26315
Germany     BASF Group                            14824    155169
Germany     Bayer Group                           14623    155169
Germany     Hoechst Group                         14565    155169
Germany     VEBA Group                            18859    809911
Format                              $999,999
Heading
                                                     STATE
                                                     NATION
     Enter conditions each row must meet:            SALES
                                                     PROFIT
WHERE  NATION  =  'Germany'                          STAFF
  AND                                                ORACLE
  AND                                                SIC
     (OR BETWEEN LIKE IN NOT UPPER DATE IS != < = >) "INDUSTRY"
Examples: DEPTNO = 10 DNAME = 'Sales' Press SELECT to enter, HINT to go on.
F1     F2      F4   F6    F8   F10  Shift-F10 BackTab Home  End cEnd
Select Preview List Clear Help Hint ShowError PrevFld Reset Do! Quit
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The rapid execution of the Preview facility lets a user make certain that the query s/he is interactively "building" is, in fact, a correct expression of the user's desire.

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# Adjunct products beef up Dbase

From page 37

popping up. But while the Lotus add-ons are often utilities to make spreadsheet-work easier, several Dbase users say they turned to third-party products because of deficiencies in Dbase.

Foremost among these is the lack of a compiler. Ann F. Bruner, a systems analyst with the Massachusetts trial courts system, says she has turned to such third-party compilers as Clipper from Nantucket, Inc. in Culver City, Calif.

However, with networking plans in the works, Bruner says she hesitates to stray far from the original product in order to avoid compatibility problems later on.

Not all users are concerned with maintaining compatibility. Companies that compile all their data bases with Clipper no longer need Dbase; therefore, continued compatibility does not matter, says Alan Gross, president of the Microcomputer Managers Association International. However, even managers who say they use Clipper keep their copies of Dbase current.

### Shortfall

Ashton-Tate President Edward M. Esber Jr. acknowledges Dbase's shortfall. "Compilers are a legitimate need for the customer," he says. "The compiler market is rapidly approaching the level that Ashton-Tate should take a look at it."

But Esber says he does not intend to squash the growing aftermarket. "We want to nurture those people. They survive off the niches of Dbase," he adds. "But as the market grows, we may want to co-opt some of it."

Dbase's ubiquity is also some managers' reason for eyeing third-party products. "Anybody can get a book on Dbase and learn to make modifications in a data base," and curious users sometimes do, according to Kingsley Mar, manager of research and development for the Systems Resource Management Group of Wells Fargo Bank, National Association in San Francisco. "We use Clipper to lock the code. It's like child-proof caps," Mar says.

### Want speed increased

Other users say they want the increased speed of a data base compiled with alternative Dbase compilers. They mention Foxbase from Fox Software, Inc. in Perrysburg, Ohio, and Quicksilver by Wordtech Systems, Inc. in Orinda, Calif.

"I have to do a lot of work with our existing code to compile it," says Jim Thompson, a systems analyst with Thompson Consulting Group in Santa Monica, Calif. "Foxbase could make that painless, and the programs will still run with Dbase."

Many third-party products "are better than Dbase but have the users understandably concerned about future compatibility," says Adam Green, a data base expert and industry observer who has written several books on Ashton-Tate products.

Green claims that users will pay more for that promise, whether from Ashton-Tate itself or an add-on vendor.

"People would prefer their compiler from Ashton-Tate," agrees R. F. Gully, a consultant with The Quilcene Corp. in Walnut Creek, Calif. "They want the support and consistency and have some product loyalty."

### Dbase upgrades

Dbase upgrades have included some of those features previously offered only by outsiders, such as a program generator in the recent version.

However, for complicated applications, some users still turn to outside, full-featured application generators such as Genifer from Bytel Corp. in Berkeley, Calif.

Ashton-Tate even invited some of its apparent rivals to its recent developers' conference in Los Angeles. "They actually help promote the Dbase standard," says Roy E. Folk, Ashton-Tate executive vice-president.

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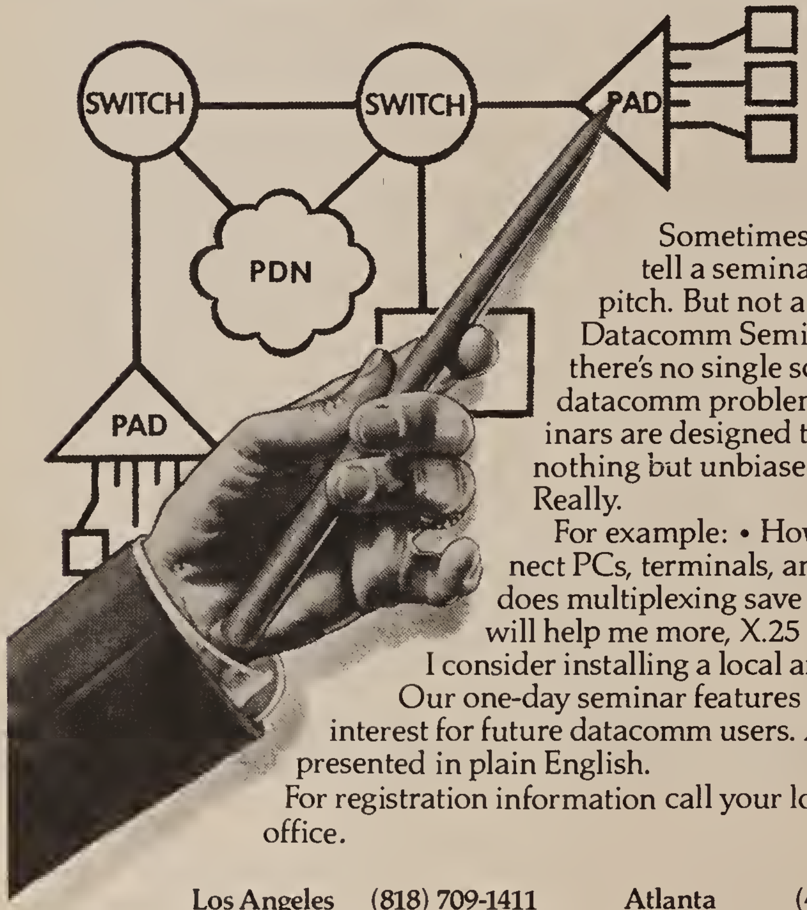

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# Cruise control for cursors

From page 37

numeric keypad is the default key) for this and other control functions.

By pressing the combinations of "5" and "+" or of "5" and "-", you can increase or decrease the speed of cursor movement. This can be done from within the application program.

Cruise Control also lets any key function as an autorepeat key at any time. You simply press "5" and the key you want repeated. It will then be repeated until you press another key. If you want to page through a document with the Pgdn key, for example, you simply press "5" and Pgdn.

### Eliminating buzz

The final basic function related to cursor control is the elimination of the annoying buzz from outrunning the keyboard buffer or getting to the end of a cursor movement range that goes on after you have released the key. Cruise Control gets rid of that.

Different application programs handle cursor control in somewhat different ways. Some, for example, create their own keyboard buffer, larger than the standard Microsoft Corp. MS-DOS or IBM PC-DOS buffer. Cruise Control lets you set, when the program is started, or change, via the "5" key in combination with the Tab key, the way Cruise Control does its job internally.

In this way, you can adapt Cruise Control to provide the best performance with any particular application program. Revolution Software provides a current list of the best strategy to use with most commonly used software.

The ability to toggle through with the hot-key facility, however, makes it easy to learn which is best simply by trying them all.

Installation is easy. All you really need to do is to copy the CRUISECOM file — it isn't copy protected — into the appropriate directory in your system's search path. An INSTALL program is included as well.

Technical support is provided through a number at Revolution Software's offices in Randolph, N.J. Chances are, however, that most users will find it unnecessary. The program is straightforward and unlikely to cause difficulty even for inexperienced users.

At a cost of $29.95, Cruise Control performs a useful set of functions and is well worth its modest price. It has certainly earned itself a permanent place in my system utilities directory.

---

# Support plan debated

From page 37

hope it gets better."

The pay-for-support program is still somewhat of an experiment at Grumman. "This is the first year. We will check it out and decide what to do next year," Galgano said.

For Galgano, a key benefit to the program is access to prerelease copies of software for evaluation. Another benefit is more product training from Ashton-Tate.

But Galgano has a couple of suggestions for Ashton-Tate. "I would like to see more flexibility in the number of people that we can have on the list to call," she said. Currently only four employees are authorized to call for technical support. "And I hope to be notified in advance of known problems with the software," she said.

Another pay-for-support customer is Nynex Corp.'s Service Co. in Boston. "We support over 2,000 PCs and well over half use Ashton-Tate products. We feel it is imperative that we have a highly technical resource available if we need it," said Kathy McKinney, manager of technical support for end-user computer services at Nynex. In addition, Nynex is a heavy user of Ashton-Tate products on local-area networks, which are support intensive. "We recognize that support is a real cost," she said.

For another user support is worth the cost. "We have not taken advantage of it yet, but we are going to since $4,000 is peanuts. Whether we'll sign up in multiples, I don't know," said Karl Kendall, manager of micro support, Metropolitan Life, New York, referring to Ashton-Tate's most extensive support offering.

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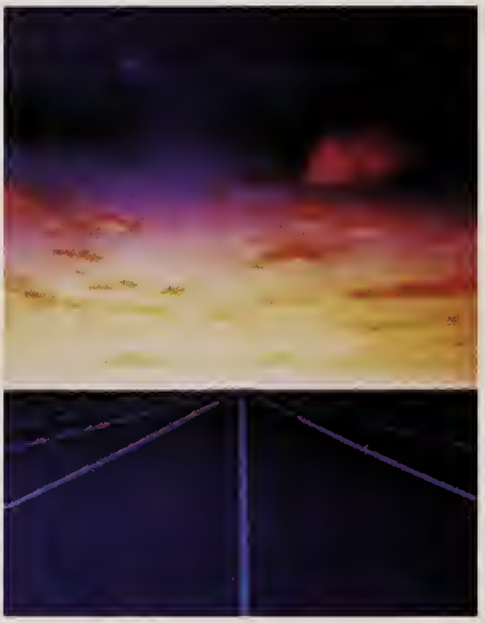

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# INTERFACE '87 CONFERENCE

## INTERFACE PLENARIES

*Users are growing increasingly apprehensive as vendors merge and purge, organize and reorganize, while there is increasing necessity to integrate their information resources and systems.*

IPL-1 KEYNOTE
Information Resources Integration: Survival Strategy for the 1980s

IPL-2 EARLY JAVA I
Mergers, Acquisitions, Alliances: Does the Large-Scale User Benefit?

IPL-3 EARLY JAVA II
AT&T and IBM Reorganizations: What to Expect

IPL-4 LOCKNOTE
Venture Capital's Impact on User Progress

## BACKBONE NETWORKS

*Critical issues include the design of such networks, the balancing of cost against traffic volumes, and interconnection from the backbone net to on-site premises.*

BBS-1 Net Designing with Wideband in Mind
BBS-2 Balancing Cost and Performance in Voice/Data Networks
BBS-3 Interconnection Issues

## REGULATORY/LEGAL UPDATE FOR '87

*Deregulatory activity didn't all come to an end with Judge Greene's decision on AT&T divestiture. The FCC and state public utility commissions have weighed in with their own contributions.*

RLU-1 On the Docket in '87: User Concerns
RLU-2 Local Access Cost/Service Forum
RLU-3 Computer Inquiry III: What's Left for Users?

## BASICS AND TUTORIALS

*Newcomers to INTERFACE will appreciate these "grounding" sessions in fundamental subjects such as voice, datacomm, network design, SNA, T-1, Packet-Switching and ISDN. Treatment of these subjects, while introductory, is also authoritative.*

BAT-1 Basics I: The Voice Network
BAT-2 Basics II: DataComm Theory, Concepts and Components
BAT-3 Basics III: Network Topologies
BAT-4 T-1 Fundamentals
BAT-5 ISDN Overview
BAT-6 SNA Building Blocks
BAT-7 Packet-Switching Nets

## APPLICATIONS ENVIRONMENT UPDATES

*Business communications in the next decade will be dominated by the need to link desktops with mainframes, by the requirement for cost-effective mail (and "voice-mail") systems, by "workplace automation," by "image communications centers" and by a series of standardized protocols for precise management of industrial processes.*

AEU-1 Communicating with Departmental Computers
AEU-2 Mail-Message Systems that Optimize the X.400 Standard
AEU-3 Workplace Automation: New Framework for Integration
AEU-4 Image Communications Centers: Where They Fit
AEU-5 A Better MAP/TOP for the Factory Floor

## NETWORK ENVIRONMENT ISSUES

*It turns out that information networks proliferate, merge, consolidate and agglomerate almost as frequently as the organizations they serve! INTERFACE '87 examines nine aspects of this phenomenon ranging from the choice of network architecture to the hiring (and keeping) of qualified network professionals.*

NET-1 Choosing a Network Architecture for the Decade of the 90s
NET-2 Net-to-Net Connectivity Advances
NET-3 What's COS Doing for OSI and Other Proposed Standards?
NET-4 Software-Defined Networks: Who's Really in Control?
NET-5 Improving Your Private Network's P&L
NET-6 Preparing for ISDN Implementations
NET-7 Network Optimization with AI and Other Modeling Tools
NET-8 Network Security: Cost-Benefit Tradeoffs
NET-9 Hiring (and Keeping) Network Professionals

## SOFTWARE THAT COMMUNICATES

*While the annual bill for telecommunications hardware soars, there is an equally important rise in the cost of essential software. "Artificial intelligence" is increasingly important in network control, while users of desktop computers demand better access to mainframes.*

SFC-1 Net Control Software Adds AI
SFC-2 Voice Net Monitors and Optimizers
SFC-3 Micro/Mainframe Links to Access Mainframe Software
SFC-4 Micro Operating Systems in the Mainframe World

## INTEGRATING DATA BASES

*Desktop users can now have local mass storage of as much as 70–100 megabytes. The integration of these data bases with a mainframe data base is a priority for systems professionals and MIS directors.*

IDB-1 Integrating Micro and Mainframe Data Bases
IDB-2 Data Base Architectures for Application-Driven Networks
IDB-3 Data Base Packages for Remote Workstations

## LAN ADVANCES FOR USERS

*Is this finally "the year of the LAN?" Perhaps so, as vendors and carriers wheel into position the building blocks, hardware and software, to make LANs both economically feasible and operationally desirable.*

LFU-1 LAN Utilization Survey
LFU-2 LAN Concepts and Architectures
LFU-3 Local Data Transport: More Options for Users
LFU-4 On-Premises Cabling (Workshop)
LFU-5 What's Coming in LAN Software, Servers and Gateways

## APPLICATIONS SHOWCASE

*Nobody knows the terrain better than the chap who's actually been there! That's the underlying premise for INTERFACE's annual survey of significant applications—as users themselves report on perils, pitfalls and payoffs!*

APP-1 T-1 at Its Best
APP-2 The High Speed LAN
APP-3 Network for Science: Progress at NSF
APP-4 Fiber Optic Throughput: SPRINT Ahead

## TECHNOLOGY HORIZONS

*INTERFACE experts will survey network related technologies such as digitized voice, data compression, multi-processor architectures, CD-ROM and the network roles for 386-based desktops.*

TEH-1 Multi-Processor Architectures for Information Networks
TEH-2 Network Roles for 80386 Systems
TEH-3 Let's Hear It for Digitized Voice!
TEH-4 Data Compression: Tips and Trends
TEH-5 Where CD-ROM Can Fit in the Net Environment

## COMMUNICATIONS PRODUCTS HIGHLIGHTS

*Whether your immediate concern is the analysis of monthly telecommunications bills, or selection of MODEMs and MUXs, you're sure to find sessions in this group guaranteed to make you a more sophisticated purchaser.*

CPH-1 Switch Architectures for the 1990s
CPH-2 What More to Expect from Centrex
CPH-3 Telephone Management Systems: Update for Users
CPH-4 Portable Terminals for Data Entry On-the-Go
CPH-5 The MODEM-MUX Price/Performance Spectrum
CPH-6 Fiber Optics: What's New

## INTERNATIONAL COMMUNICATIONS OUTLOOK

*Unrestricted trans-border data flow is all too often more a goal than a reality. Multi-nationals will profit here from sessions on cost-saving trends, worldwide telecomm deregulation and services available from overseas carriers.*

ICO-1 Cost-Saving Trends in Global Communications
ICO-2 Deregulation Worldwide: Where Users Can Benefit
ICO-3 Feature-Full Services from International Carriers

## IMAGE COMMUNICATIONS ADVANCES

*Time was when "data" was communicated; now it's information itself, digitized for easier processing and transmission. Frequently, this information is in the form of a video signal or a graphics image; yet, it's just more data for your systems to handle.*

ICA-1 Business Videotex Systems: Viewing the Potential
ICA-2 Off-the-Shelf Videotex Systems
ICA-3 Wideband Teleconferencing: Roundtable
ICA-4 Teleconferencing Alternatives
ICA-5 High Speed/High Res Communication of Text and Graphics

## BUILDING BLOCKS FOR BYPASS

*With local access costs skyrocketing, users seek to bypass the ministrations of the BOCs and their independent counterparts. Sessions here will include a user-vendor roundtable, with spontaneous discussion sure to provoke both controversy and attention!*

BBB-1 Bypass vs. Local TELCO: Roundtable
BBB-2 A Plethora of Products for Metro Bypass
BBB-3 Bypassing Bottlenecks with V-SAT Networks

## THE EXECUTIVE BRIEFING: THE STRATEGIC APPLICATION OF INFORMATION RESOURCES

*Under the direction of network theoretician and consultant Dr. Howard Frank, this year's Information Executive Briefing has been designed to offer a full panapoly of strategic perspectives in one day, with even a bit of time left over to walk the exhibit floor!* **(Special Registration required)**

TEB-1 Information-Driven Organizations: The Strategic Perspective
TEB-2 Leveraging the Payoff from Technology Advances
TEB-3 Planning the Application of Integrated Information Resources
TEB-4 Capital Investment Strategies for Major Information System Purchases
TEB-5 Network-Based Information for Executive Decision-Making
TEB-6 Positioning Your Organization for Open Systems Interconnect (OSI)

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# How interruptible is your computer system?

*Buying UPS is actually an insurance, not a technical, decision. MIS must determine not only whether to provide UPS, but how much protection is enough.*

By ALAN RADDING

If a blackout were to throw the entire U.S. into chaos, only about 10% of the country's mainframes would still be up and running. These mainframes belong to those organizations that were farsighted enough — or scared enough — to install uninterruptible power supply (UPS) systems as protection for their computers and corporate data.

Most organizations do not start looking at UPS until after they have suffered a critical loss because of a sudden power outage. "Most people can't justify it until the last crash," says Murray Lazar, senior vice-president of K/W Control Systems, Inc. in Middletown, N.Y., a major vendor of UPS systems.

The reason so few computer systems are protected by a UPS is not a technical issue but a complex management issue. The decision to spend thousands, or in some cases millions, of dollars on a UPS system requires that management determine the hour-by-hour or even minute-by-minute value of the organization's operations. Recovery time as well as actual downtime must be considered, and the potential cost of possible hardware damage must be calculated.

Purchasing a UPS is an insurance decision, and like in every insurance decision, managers must take a calculated gamble. They must decide not only whether to install a UPS but also how much is enough.

They must decide if two minutes for an orderly shutdown is sufficient and weigh the risk to their system of, say, three days without power after a storm.

Other questions must be considered. What does the work force do when the computer is down? What is the effect on an organization's customers? What happens to communications within the organization and with the outside world? Are governmental or public safety mandates involved?

### Fact of life

The reason for installing a UPS is based on a fact of life in the computer industry — that the machines require a steady source of the proper level of power. As recently as 10 years ago, computers would crash if power were interrupted for as little as one-quarter of a cycle, says Norm Woolard, a power and environmental specialist at Prime Computer, Inc.

Today's computers have better ride-through capability — or the length of time a computer can tolerate a loss of power — and can return to operation without problems after a loss of power for as long as 4 cycles, which is still only a fraction of a second.

For every kilovolt-ampere of power, Woolard notes, there is much more at stake. While these machines may be more tolerant of power fluctuations, they are also performing many more operations and handling much more data than computers of a decade ago.

Jan Cates, manager of operations control at Duke Power Co. in Charlotte, N.C., had to wrestle with this inverted logic as he planned the utility's own UPS system. His

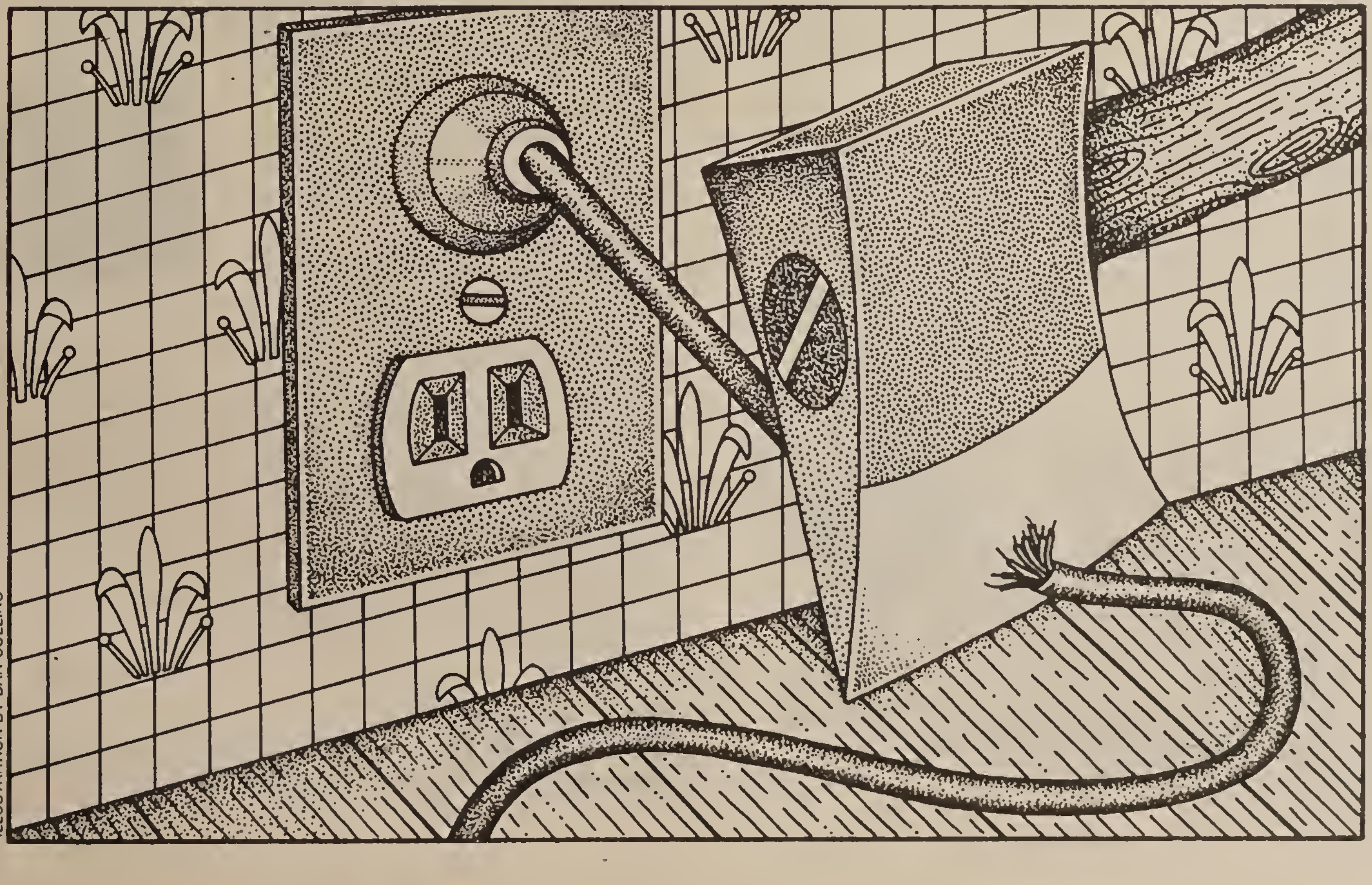

ILLUSTRATION BY DAN COLLINS

**About the author**
*Radding is a Boston-based author specializing in business and technology.*

> *Figuring the cost of a power outage is not a straightforward calculation. There is the cost of the actual outage — hardware damage or data lost in a computer crash or through disk drive damage. Determining the cost of recovery — for both hardware and data — could take much longer.*

computers were requiring less power to perform more computing, but, he explains, "the power was becoming much more concentrated. We were looking at a much higher wattage per square foot."

Figuring the cost of a power outage is not a straightforward calculation. There is the cost of the actual outage — hardware damage or data lost in a computer crash or through disk drive damage.

Determining the cost of recovery — for both hardware and data — could take much longer. And there is the potential cost of hardware problems from the sudden power drop and return surge.

Finally, there are intangible costs, such as the effects of telling customers their data has been lost, losing business that goes somewhere else when you stop taking transactions or sending employees home.

The technology for UPS is readily available: More than 175 vendors are selling what each considers to be UPS equipment, one UPS salesman complains.

### Out of the woodwork

At least several dozen of these are well-known, highly regarded electronics manufacturers.

A major power outage brings these UPS salesmen out of the woodwork.

In the aftermath of a major power loss, "As soon as the power came back on, I started getting calls from dozens of UPS companies," says the engineer for a small, completely automated broadcasting facility located in downtown Boston, which was already equipped with 45 minutes of UPS battery backup.

Fidelity Systems Co. in Boston was the victim of a major power loss late in March 1983, when a midday explosion and fire in an electric company manhole cut off all the power to blocks of office buildings that were located in the city's financial district.

"The power was out for five days," recalls Michael Simmons, president of Fidelity Systems, the division of the Fidelity Investments money-market funds organization that is responsible for computer operations.

Fidelity's computer systems went down, and thousands of financial transactions totaling millions of dollars stopped.

The computers remained out of service for 22 hours until the company could bring in rented diesel generators mounted on large flatbed trucks and patch them into the building's electric power distribution system, bypassing the Boston Edison Co. system entirely.

Today, if a major power blackout were to occur, "nothing would happen" at Fidelity, Simmons says. "We wouldn't care, and most people probably wouldn't even notice."

In the aftermath of the March 1983 blackout, the company installed an extensive UPS.

Fidelity's decision to spend a couple of million dollars was a clear-cut one. After learning the lesson of March 1983, the company realized that when its computers went down, it was out of business.

A smaller but still severe power outage that occurred later, in October, confirmed the company's decision to install a complete UPS system. The cost of the UPS system "if figured over time, is not as much as an insurance policy," Simmons says.

The company did more than just install a UPS system: It developed an entire plan to continue its essential operations on a restricted power basis and built

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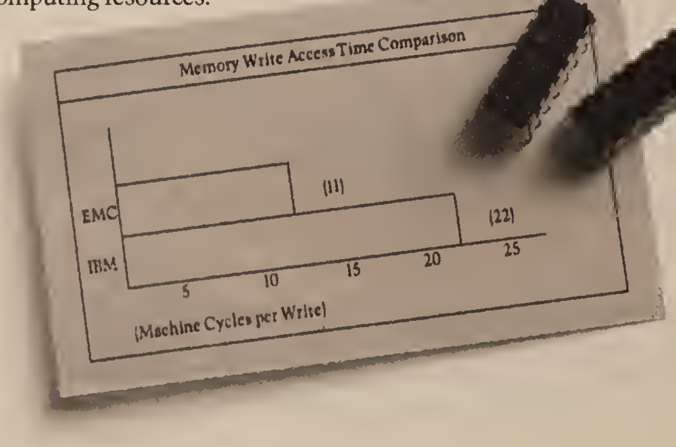

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# FIND CARGO LOST AT SEA!

## *ITT rushes aid to fleet*

A California shipping agent, who used to worry about keeping in touch with a worldwide fleet of container ships by telex, called his operation "shipshape" today.

Bill Lowe, a manager for Los Angeles-based Merit Steamship Agency, Inc., added that ITT Worldcom experts had made it "much, much easier" to transmit cargo schedules.

Merit, a nationwide shipping agency, is one of the few agencies to represent a number of steamship companies in worldwide cargo transport, Mr. Lowe explained.

"We dispatch over 40,000 telex messages a month," he said. "So we really needed a first-rate communications network to keep our customers on top of their imports and exports."

**BACK IN TOUCH—Shipping agent Bill Lowe after rescue.**

**Service...and Savings.**

ITT Worldcom solved all the sticky problems that Merit faced with its last international carrier, Mr. Lowe pointed out. "And they even cut some of our costs—by 50%!"

Among Merit's major clients is Japan Line, which each year moves thousands of containerized shipments, inland and overseas.

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> ***UPS covers a broad range of devices and capabilities, ranging from a few batteries built into a surge protector to large battery racks coupled with backup diesel generators.***

into its UPS requirements enough capacity to take care of those needs. Keeping only the computers running would preserve data and prevent possible hardware problems but would not in itself keep the company operating.

If the power problem were to last longer than a few minutes, Fidelity's department managers, following a predetermined plan, would start switching off power selectively. Only a minimum level of operation would be maintained, keeping elevator service, lights, phones and necessary accessories running to accompany the computers.

Today, Fidelity uses a total of 196 Exide Electronics Corp. batteries, which provide its computers with up to 15 minutes of power to cover brief disturbances in the public power supply. Long before this first source gives out, twin 820-kVA diesel generators kick on. As soon as these diesels are running, responsibility for generating power is automatically transferred to them. The diesels can run nonstop for 72 hours before they need to be refueled and can be relied upon almost indefinitely.

### Who uses UPS and why?

The term "uninterruptible power supply" covers a broad range of devices and capabilities, ranging from a few batteries built into a surge protector, which provide two minutes for a graceful shutdown of the computer, to large battery racks coupled with backup diesel generators to provide a true UPS for a long duration.

Technically, a UPS system is a group of devices that sits between the electronic equipment and the public power supply to ensure a constant, stable supply of power.

A fully configured UPS system typically involves batteries, rectifier, inverter and transfer switching.

The system senses when the power supply is fluctuating and compensates for it. An alternative power source, such as a diesel generator, is often the final component of a UPS system.

In the past, UPS was considered appropriate only for large businesses that relied heavily on mainframes, particularly financial companies. Increasingly, though, UPS manufacturers have seen growing interest from small companies.

"Mom and Pop operations that are dependent on their small computer need UPS, too," says Ken Bates, a sales engineer at Bates and Associates in Abington, Mass., an Exide Electronics value-added reseller.

Large systems, defined by Bates as those requiring 15 kW/3-phase power or more, need extensive UPS systems; about 35% of those UPS installations ultimately provide for some kind of alternative power such as diesel generators.

For systems requiring 15 kW or less, computer operators tend to rely on a battery-based UPS that provides from two to 15 minutes of power for an orderly shutdown, "and then they just wait out the power failure," Bates says.

UPS systems fall into two basic categories: on-line and off-line. Simplified, an on-line system runs public power through the batteries, a process in which the batteries are constantly being charged.

If the public power fails, the batteries are already operating and able to compensate instantly for the power loss.

The batteries will carry the system for a limited amount of time until it can be shut down in a safe, orderly fashion or until an alternative power source can be brought into service.

In an off-line system, the batteries sit fully charged but idle until the load is transferred to them during a power fluctuation.

Improvements in the speed of electronic switching (typically six milliseconds) have made off-line systems, which are considerably less expensive than on-line systems, much more reliable, especially in smaller systems, notes Bill Niemann, Boston district sales manager for Topaz Electronics, a San Diego-based UPS manufacturer.

### Who's buying; who's not

"A computer is production machinery for a bank," says George DiNardo, executive vice-president of Mellon Bank N.A. in Pittsburgh. When the computer is down, production stops, he explains, noting the electrical supply system is the Achilles' heel of that machinery.

Mellon Bank provides computer services for 500 banks in 30 states and is subject to a ruling by the federal comptroller of the currency that requires it to have backup power, according to DiNardo. In addition, he says, "the board of directors are on your back if the computers are down."

But it was a natural disaster, not a federal regulator or the board of directors, that pushed the bank into a decision to proceed with a UPS system 12 years ago. After ice jammed the rivers around Pittsburgh in spring 1974 and water came within

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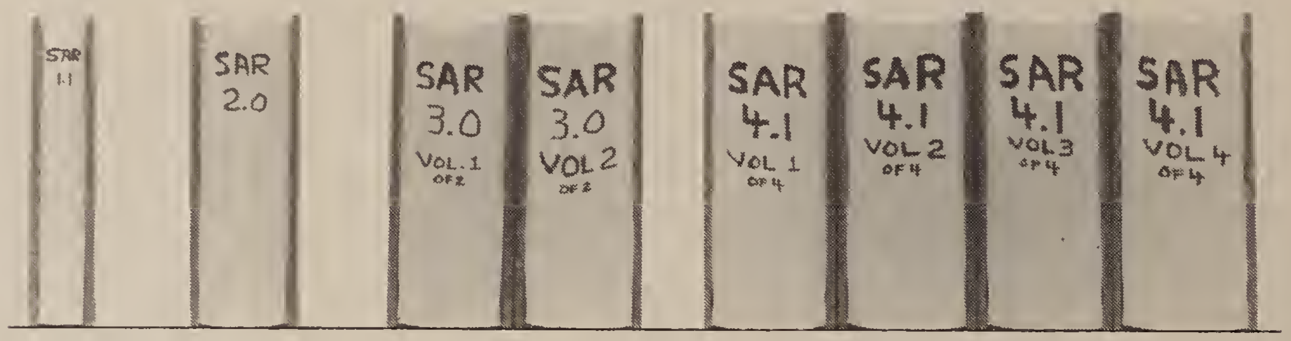

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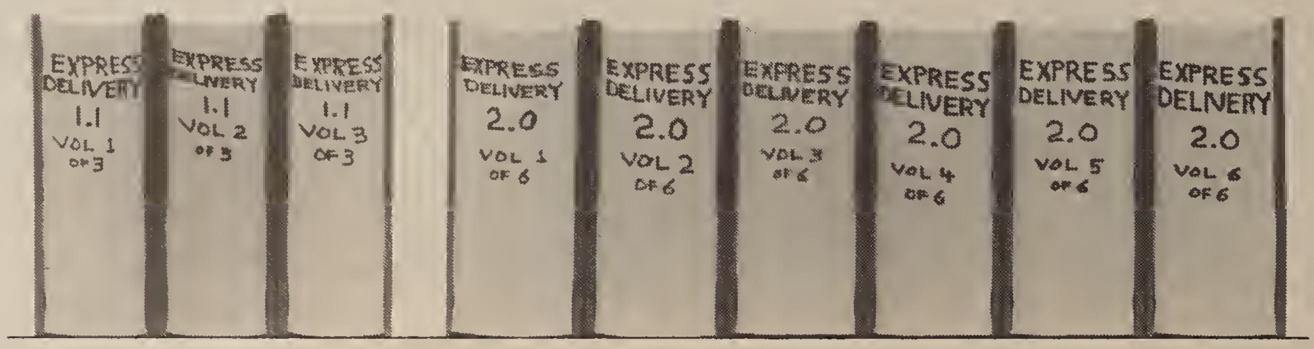
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one foot of the power generating station that supplied the bank, work began on a UPS system.

> *Once it has been determined that a UPS system is required, the organization must decide exactly how extensive a system is desired and whether the system is to be part of an overall emergency operating procedure.*

"We were frightened and moved as fast as possible," DiNardo says. Now the bank maintains battery capacity equal to two World War II submarines — which ran on batteries when submerged — has two 12,000-horsepower diesel turbines and is installing a third.

When the John C. Lincoln Hospital and Health Center in Phoenix converted to a full on-line system in 1984, the hospital, which already maintained one UPS system for its life-support equipment, made the decision to add a full UPS system, including diesel power backup.

"When we were just handling admitting or payroll, we could get by without UPS," says John Eric Thomas, the hospital's director of information systems and services. But when the system started to handle all aspects of the hospital's work, eventually including medical testing, a UPS system became important.

Not every organization comes to the same conclusion. Russell Stevenson, senior systems analyst at Campbell Soup Co. in New Jersey, reports that the company considered a UPS system for the computers used in manufacturing processing but ultimately decided against it for budgetary reasons.

The company has never experienced a critical crash due to power failure. "The computer recovers itself. It closes its files. We'd only lose what's in flight," Stevenson says.

Foodarama Supermarkets, Inc., based in Freehold, N.J., has looked at UPS systems for its point-of-sale terminals but decided against installing one, mainly because the benefits do not outweigh the expense, says Ken Warner, manager of operations.

"We've never had a crisis where we've had to recreate files," he explains. His computer manages to ride through small glitches in the power supply.

Chubb Life America does not use a UPS system either, although the company is just starting to look into the situation, says Marty Wagner, Chubb's director of computer operations.

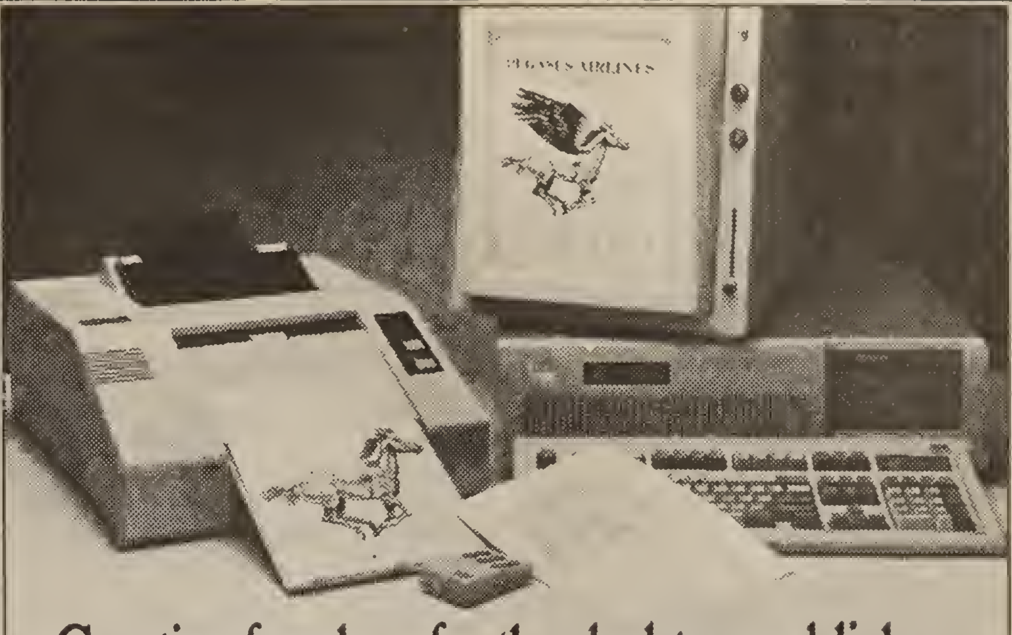
The company has never experienced a catastrophic power failure, although periodic outages have brought the computer to a halt. "So far, it isn't something that justifies the cost, considering the downtime that we've experienced," she says.

### Beyond utilities' control

The power companies are not much help when it comes to providing reliable power. Most utilities perform to specifications, but those specifications are inadequate for reliable computer operations. Utilities deliver the stated voltage with a variance of ± 10%, "but they are often talking about a one-minute time frame," which is unacceptable for a computer, Prime's Woolard says.

Boston Edison admits as much. "Voltage variations or electrical disturbances may occur at any time and are beyond the control of Boston Edison," the company states in a pamphlet entitled "Minimizing the Effect of Power Variations on Sensitive Electronic Equipment."

"It is physically and economically impossible to offer 100% reliable power," a Boston Edison spokeswoman explains, saying there are



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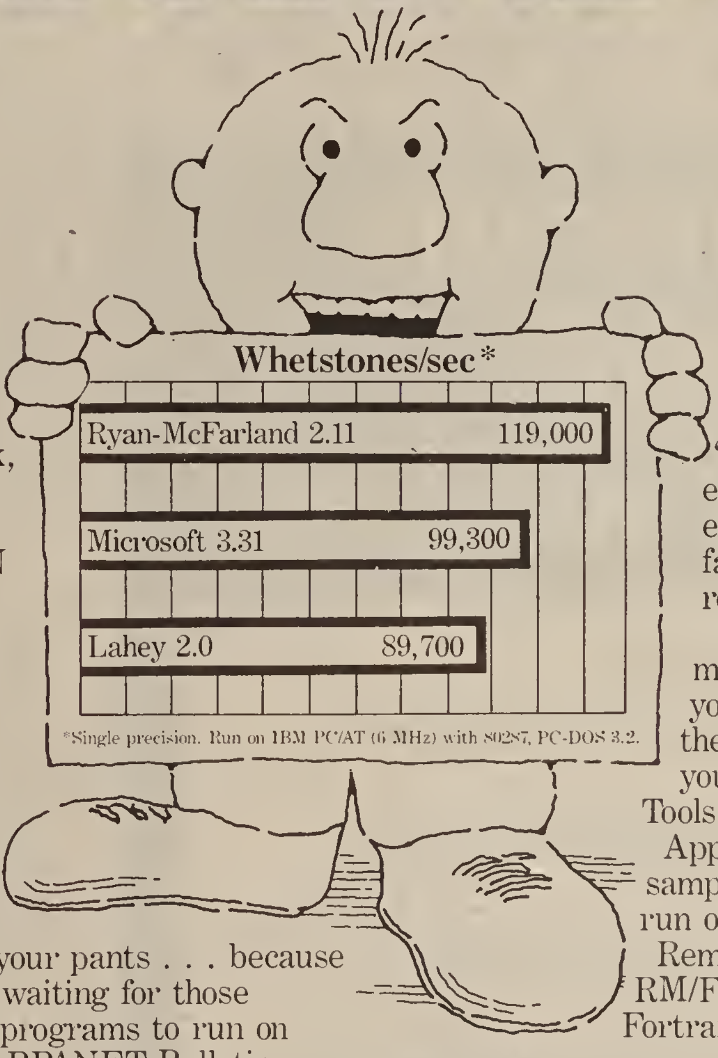

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## Choosing the best test plan

By GEORGE DANBURY

Acceptance test plans for data center power systems are offered in varying levels of complexity and flexibility, depending on the equipment involved and the level of performance verification desired by the customer. Vendors offer three different test plans.

**Basic test plan.** The basic test plan is designed for the customer who desires an acceptance test for a single uninterruptible power supply (UPS) module.

This plan consists of a series of four tests designed to verify the most critical performance parameters of a UPS module. These include the following:

- Documented functional test.
- Voltage regulation test.
- Transient response test.
- Battery rundown test.

**Standard test plan.** The standard test plan is designed for customers whose acceptance requirements are more comprehensive than those covered by the basic plan.

The standard plan consists of a series of tests designed to verify a majority of the manufacturer's performance specifications. It may cover virtually all of the equipment in the total power system, including 60- and 415Hz UPS modules, 60- and 415Hz frequency converters, 60Hz power stabilizers, battery systems, paralleling systems, power distribution systems, monitoring and management systems and associated switch gear.

The tests include the following:

- Documented functional test.
- Voltage regulation test.
- Transient response test.
- Battery rundown test.
- Efficiency test.
- Total harmonic distortion test.
- Thermal scan.

Additional tests may be specified by the customer to meet specific site requirements.

**Comprehensive test plan.** This plan is designed to measure virtually all of the manufacturer's performance criteria for all components of the total power system as well as site-specific conditions affecting the total power system. This test plan can include the following:

- Documented functional test.
- Voltage regulation test.
- Battery rundown test.
- Efficiency test.
- Total harmonic distortion test.
- Overload test.
- Unbalanced load test.
- Frequency regulation test.
- Dynamic signal analysis.
- Internal redundancy test.
- Signature analysis.
- Infrared (video) record.

Additional tests may be added to this plan to meet specific customer and site requirements.

Documented results of on-site acceptance tests performed in accordance with the above-mentioned test plans are recorded in the field on portable computers and are later incorporated into a final, computerized acceptance test report. ■

*Danbury is vice-president of K/W Control Systems, Inc., Middletown, N.Y., a UPS vendor.*

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simply too many mechanical elements that are subject to breakdown. In general, utilities are vulnerable to storms, fires and other natural disasters.

For sensitive electronic equipment, Boston Edison recommends the use of dedicated circuits, in-house transformers and the specification of low-impedance equipment.

In addition, the power company suggests the use of surge suppressors, regulators, motor generators equipped with heavy flywheel and, finally, a UPS system.

The first determination an organization must make is whether it needs a UPS system at all. According to K/W Control's Lazar, "the cure could be worse than the disease." After a company totals up the costs of the UPS system, installation, additional space requirements, special considerations or municipal permits to accommodate the system and maintenance, not to mention the additional energy costs, and compares all that with the cost of a power outage including downtime, recovery time, damaged data, hardware damage and customer and employee relations, a UPS system may not be the right solution.

### Do you need a UPS?

Not every power problem and computer crash requires a UPS solution. A properly planned and prepared site will eliminate many power problems. For instance, poor grounding of the existing power distribution system, resulting in power-line noise, is a major source of crashes that appear to be the result of momentary power failures, Woolard says.

Of the problems he is called upon to solve, he adds, 20% can be corrected simply through proper rewiring. Before an organization invests in UPS to compensate for suspected momentary disruptions in power, experts suggest investing in a site study and power monitoring.

Once it has been determined that a UPS system is required, the organization must decide exactly how extensive a system is desired and whether the system is to be part of an overall emergency operating procedure. The choices vary. Comprehensive on-line systems like Fidelity's are part of a total plan that allows a reduced but acceptable level of operation to continue uninterrupted through the power outage.

Small, off-line UPS systems are available that use a few maintenance-free sealed batteries to provide only several minutes of emergency power, enough for what is euphemistically called a graceful shutdown. A graceful shutdown, "if you can call coming to a sudden screeching halt graceful," one MIS manager observes, allows a company to preserve all data, properly close all files and prevent hardware problems, but it does not allow the computer to continue operating during the outage. It saves the time-consuming and costly job of reconstructing files once power is resumed.

Since the majority of power outages take the form of momentary interruptions that might destroy data and damage hardware but would not otherwise put a computer operation out of commission for hours or days, this type of system is ideal for many smaller organizations, Bates notes.

Columbia Savings and Loan Association in Fair Lawn, N.J., installed its UPS system with alternative diesel power five years ago when it moved to its current location. At its old site, Columbia had nothing. Power problems never destroyed data files, but they wreaked havoc with the programming, reports Margaret Kaneftke, manager of computer operations. "We would have to go back and start from the beginning," she says.

The power outages also damaged the hardware. Comparing that experience with her system now, she concludes, "if you can't have a full system with a generator, at least have some kind of battery backup."

### Implementation considerations

If you decide to keep the computer running through a shutdown, how much more equipment do you need to keep powered? You probably will want storage devices and some terminals, but do you need printers? You need some lights. Air conditioning is necessary for some computers, and, in the case of water-cooled machines, pumps must be kept running as well.

Finally, you must project your needs three or five years ahead. "Not only do people have to think about their immediate needs, but their future needs, at least the near future," Topaz's Niemann says.

The problem of bringing UPS into a company is half managerial and half technical, says Robert Bicknell, vice-president of data center operations at First National Bank of Cincinnati, which put an extensive UPS system into its new computer center. Management must decide the insurance question, but the technical staff must implement the actual system.

The first task of implementation is determining the load. K/W Control's Lazar suggests two possible methods. One is to add up the stated power consumption figures for each piece of equipment for which UPS will be provided and reduce the total by 30%. An alternative method is to calculate power consumption by figuring 50 watts per square foot of computer room.

Once a company has determined its current power needs, it should consider its future needs. For instance, Brockway, Inc. Airline Division, which recently expanded its computer center to six processors, is planning a UPS installation now, but it is planning its system to support eight processors. Because of where the size breaks come with diesel generators, however, a unit large enough to support eight processors will actually support 10 or 12, which

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allows the company room to expand at a later date, notes Robert D'Orazio, Brockway's manager of data processing.

Environmental considerations must be heeded as well. UPS systems require space for racks of batteries, switching equipment, alternative generators and fuel. Ventilation provisions must be considered, and various municipal permits, such as for fuel storage, may be required. "When we built this facility, we thought our needs through and got everything approved for the UPS when we obtained the building permits," D'Orazio says.

Finally, access must be provided. The UPS system does not have to be adjacent to the computer room, but the farther away the UPS system is, the more power will be lost on the way to the computer.

### Nonlinearity

The biggest technical problem encountered with UPS systems is the problem of supplying enough power to support a nonlinear load. Ideally, computers prefer a clean 60Hz sine wave, but because the load in a computer room is nonlinear, distortion — most often visible as wavy lines on the CRT — is introduced. Similarly, Lazar warns, diesel generators can introduce distortion when the full load of the computer system hits them. A key test for any UPS system is how well it handles these nonlinear loads.

To avoid or solve these problems, "coordination between the UPS vendor and the user is mandatory," Lazar says.

None of the UPS system users contacted about their systems reported any problems with nonlinear loads or inaccurate specifications.

Careful specification of the system and detailed screening of vendors eliminate many of these problems. "More consultants are specifying the equipment, and the DP managers are much more sophisticated. They are specifying UPS systems as carefully as they specify disk drives," Lazar notes.

### Pricing a system

The cost of UPS systems varies as widely as the computer systems being protected. As a rule of thumb, Niemann suggests that one dollar per watt for the new off-line systems is a good estimate. Bates estimates that on-line UPS systems for mainframe machines will start in the tens of thousands of dollars and run into hundreds of thousands of dollars.

Smaller systems can cost $5,000 to $25,000, or an estimated $500 to $1,000 per kilovolt-ampere. A UPS system that is part of an overall emergency operating system like Fidelity's can cost several million dollars.

UPS systems are not installed overnight. A complete on-line system with diesel generators takes six to eight months to install, while small systems can be installed in a few weeks. Major installations, such as the UPS system installed in the New York Stock Exchange, are installed in phases over a period of months or years. An optimal time to install a UPS system is when a new computer facility is being built or an existing facility is being expanded.

The final step in implementation is the ongoing system testing and maintenance. A UPS system is supposed to eliminate technical problems, but, if it is not regularly maintained and tested, it can become just another piece of equipment prone to failure. Because the system is not in daily use, potential problems are less likely to be discovered casually at the most inappropriate time — before a critical failure.

A typical testing routine is to turn on the diesel generators weekly, check out the system under load quarterly and extensively test the entire system under full load at least twice each year.

### When UPS is a smart buy

Nobody likes to buy insurance of any kind. It is an expense that, under ordinary circumstances, can be done without. When circumstances are not ordinary, however, insurance suddenly appears to be a smart buy.

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> ***Nobody likes to buy insurance of any kind. It is an expense that, under ordinary circumstances, can be done without. When circumstances are not ordinary, however, insurance suddenly appears to be a smart buy.***

Eventually, anyone with an integral computer operation is going to have to confront the question of UPS. Nobody is predicting what will happen in coming years, and many forecasters are suggesting that the situation will get worse because few new modern power plants are coming on-line. To protect themselves, computer managers will insist on more control over the power supply.

Since Fidelity installed its UPS system, about 20 unplanned instances have occurred when the UPS has switched on, Simmons estimates. While none of the subsequent power outages have been as dramatic as the March 1983 fire, each would have shut down the computer system.

From Simmons' perspective, the millions the company spent on the UPS system keeps looking more like a bargain. ■

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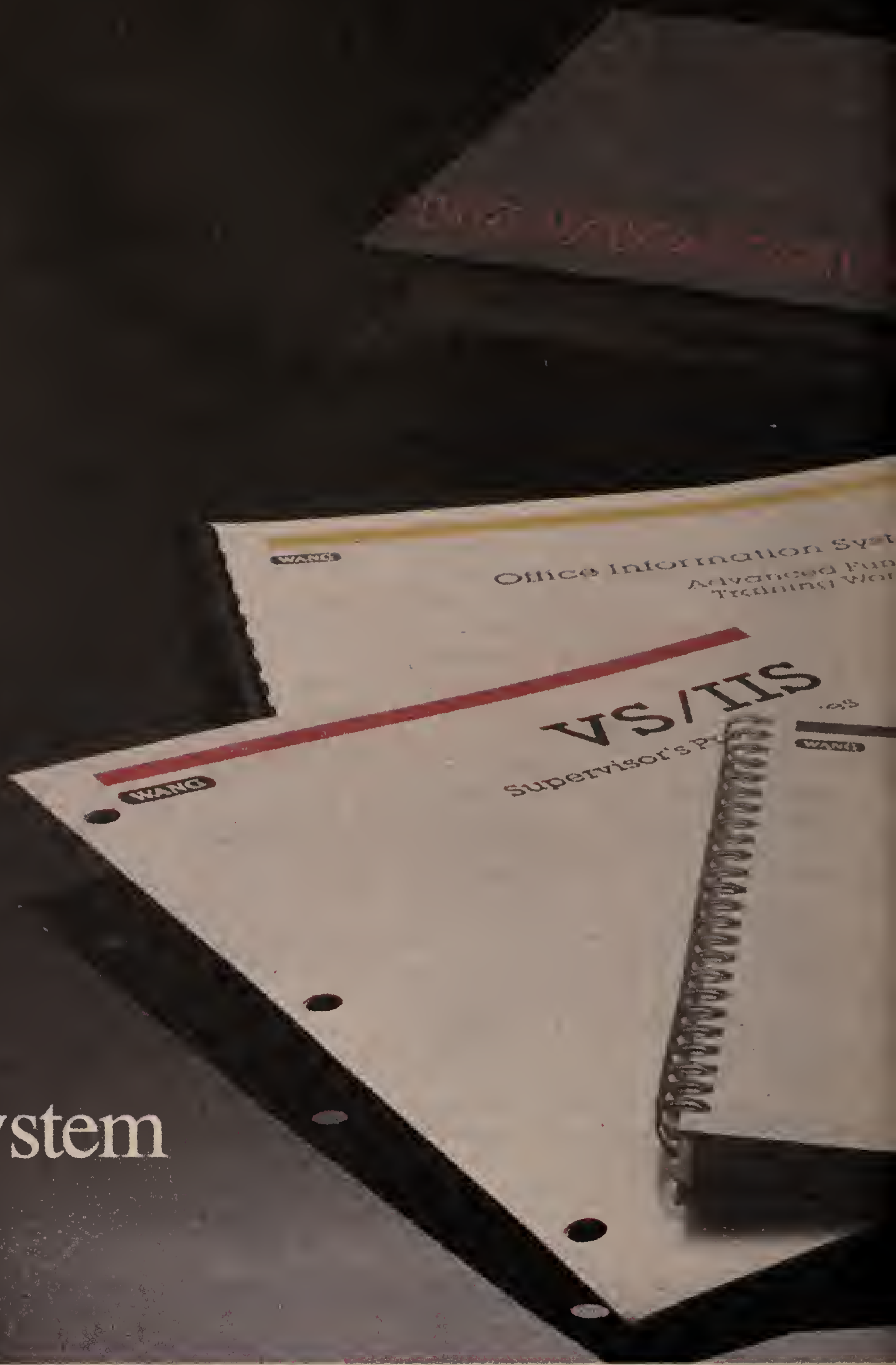

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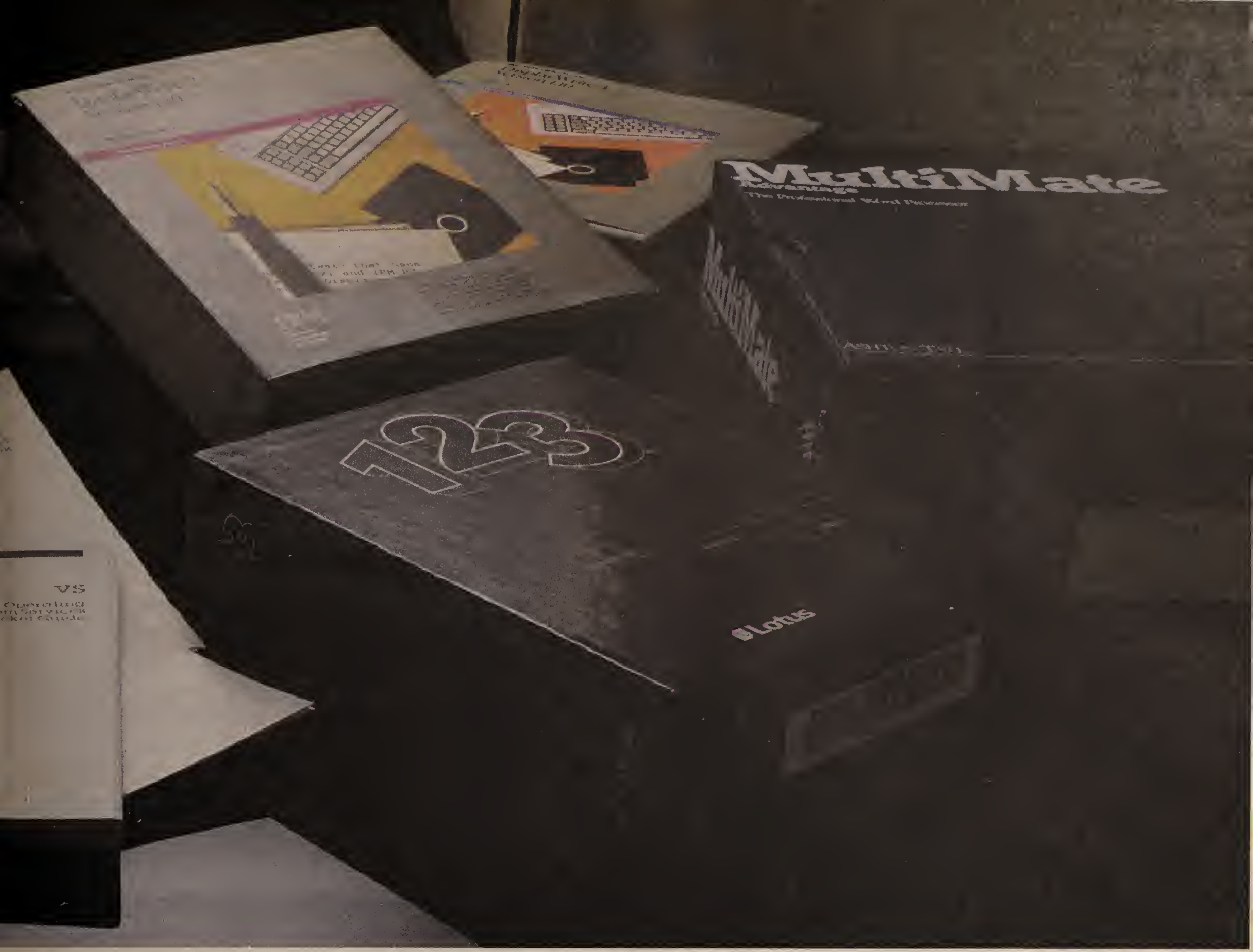

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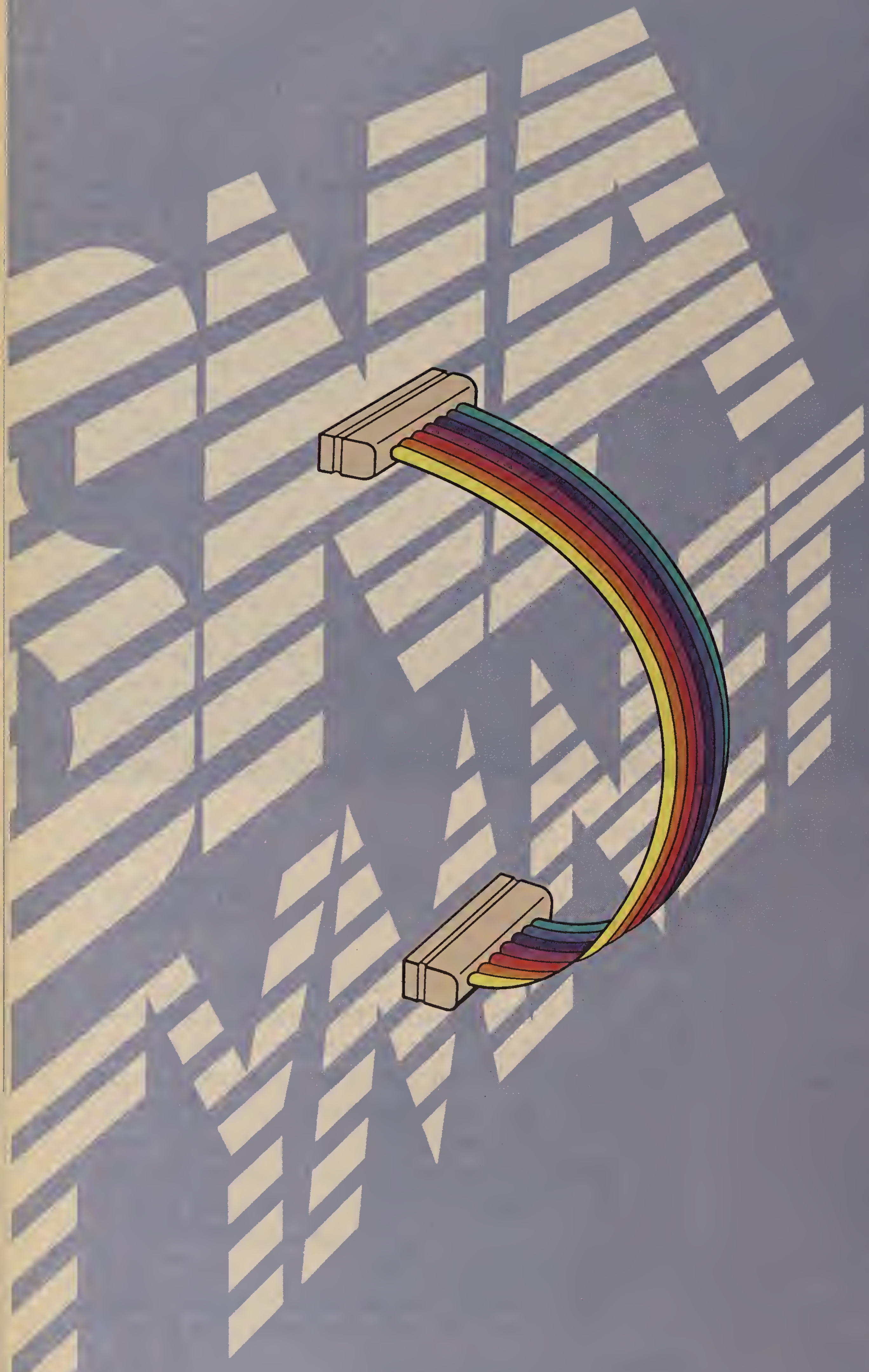

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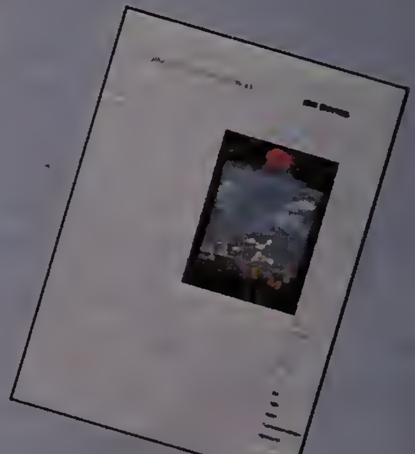

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**TAKING CHARGE**
James L. Young

# Your style as manager

Years ago, Gerald Weinberg published a book entitled *The Psychology of Computer Programming.* It was a landmark statement focusing attention on a new dimension of a new profession that had been seen as a largely technical practice. It was also an important step because it emphasized not just personnel management issues but also environmental needs, such as group dynamics and work habits, that were seen as unique or at least highly individualized.

That same analysis needs to be applied to data processing management. Unlike Weinberg, it is doubtful we would find a single distinctive profile but rather a diverse assortment of attributes, motivations and behaviors with one thing in common: the management of the discipline of data processing.

In our effort to master the art of managing the data processing resource, we frequently overlook fundamental elements of our job. We look at the technical side, the management practices and techniques and we try to be diligent about the financial component of our responsibilities, but we ignore that component that is our own makeup. All too frequently, it is the most important component. *Our management style and personality frequently determine the fit with a particular job and contribute to our success and enjoyment or become barriers to achieving them.*

As one example, an extremely dedicated data processing manager worked hard to become part of the top manage-

See **YOUR** page 54

*Young is a principal of Worcester, Mass.-based Arthur Young.*

# Taking care of business

## DEC's MIS manager takes aim at inventory and sales

**By David A. Ludlum**

With his employer riding a business boom driven largely by its supple technology, the director of Digital Equiment Corp.'s information systems might be expected to champion the use of the latest gadgetry.

But Belford E. Cross, who holds the title of corporate manager of Digital Information Systems, is a former manufacturing executive given to describing his work in terms of inventory turns rather than instructions per second.

Just as DEC lately has worked to tailor its sophisticated technology to the dictates of the market, the company has shifted the focus of its corporate information systems function to business concerns.

Nearly three years ago, Cross — then a group manufacturing manager for Ethernet who had begun his career at DEC as an engineer and later started up a plant in Maine — was asked to interview for the top information systems job.

"There was a belief that there was an excellent architecture, excellent products and a forward-leaning technical strategy but a lack of integration with buiness requirements," says Cross, a trim, soft-spoken skiing enthusiast and father of two.

DEC's Cross

DEC sought someone who understood its business — the culture and the way decisions are made — with experience in getting things done, such as building plants and delivering products, and with credibility among line functions. "Someone who wouldn't be perceived as a techie but as someone who understood the factory floor," according to Cross.

DEC also needed someone with a reasonable technical background and credibility within the information systems department. The job calls for challenging the information systems staff to work on the most significant business problems rather than on the most appealing technology, Cross says.

A year earlier, DEC had shifted corporate information systems' reporting relationship, moving the function from finance to operations, a change aimed at making better use of the technology, observes Cross, who reports to Winston Hindle Jr., who holds the position of senior

See **TAKING** page 56

**INSTANT ANALYSIS**

*"Senior management must take responsibility for the planning, funding, implementation, testing and certification of an alternate processing strategy."*

**— Irene E. Isaac, from the "Guide on Selecting ADP Backup Processing Alternatives," issued by the National Bureau of Standards of the U.S. Department of Commerce**

# Fire enlightens Boston users

**By Donna Raimondi**

BOSTON — A fire that recently struck a 42-story building here in the financial district has shed some light on the question of how much disaster protection is enough. While the fire did not destroy data centers, it gave victims food for thought.

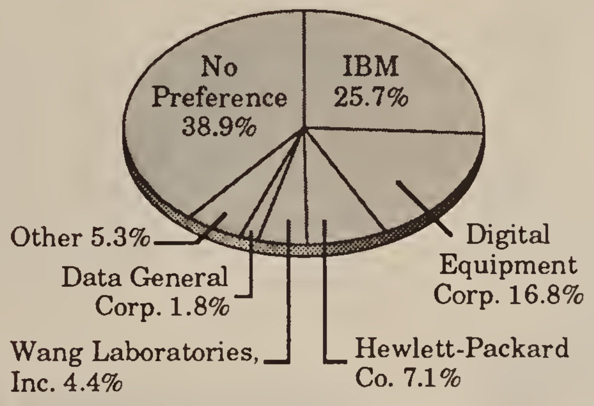
One Post Office Square was rocked by explosions at 5:45 p.m. Dec. 9 as its electrical switches blew, injuring nine occupants, two seriously. For the next week the build-

See **BOSTON** page 56

•DATA VIEW

**Open market**

*Preferred departmental system vendors*



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**MANAGEMENT MEMO**

# Typical senior exec changed focus, now earns $215,000

**The typical senior executive at a Fortune 1,000 company** made his major career breakthrough at age 34 and attributes it to being in the right place at the right time and to having moved from one functional area to another, according to a survey.

The executive, now 51 years old, was earning $100,000 a year by the time he was 35, as a vice-president, and currently pulls down compensation of $215,000 a year.

However, he said he defines success as enjoying work and effecting change; money is a secondary consideration. Public recognition is not particularly important.

These are among the facets of the typical Fortune 1,000 manager at or near the level of vice-president that emerged from a survey by Los Angeles-based executive search firm Korn/Ferry International.

### Self-portraits

The survey, based on more than 1,300 responses, reflects the executives' views of themselves. Korn/Ferry conducted the survey in 1985 and recently released a full report, including a profile of the typical respondent.

That typical executive said he believes concern for results and an urge for responsibility are necessary for success in business and that he does not place much emphasis on likability, appearance or formal business training, although general education can have a significant impact.

The executive credited his rank to hard work tempered by ambition and luck and named integrity as the most important ingredient of a successful business career.

### Younger execs more mobile

He said he has worked for only two companies and has been with his present firm for 17 years, although younger respondents showed more mobility.

His ambition is to become chief executive officer of his company — not to own his own business. He said that if he were financially independent, he would continue to work at his present position.

The executive is in general management, after starting his career in finance or accounting.

### Fast track

However, he said he believes sales and marketing is currently the fastest route to the top in his organization and will remain so in 10 years.

The executive's average workweek is 56 hours. He said he spends about 49 days a year traveling on business and takes 14 vacation days a year. He fully intends to retire at or before age 65.

He said he feels the biggest threat to his career is a corporate reorganization.

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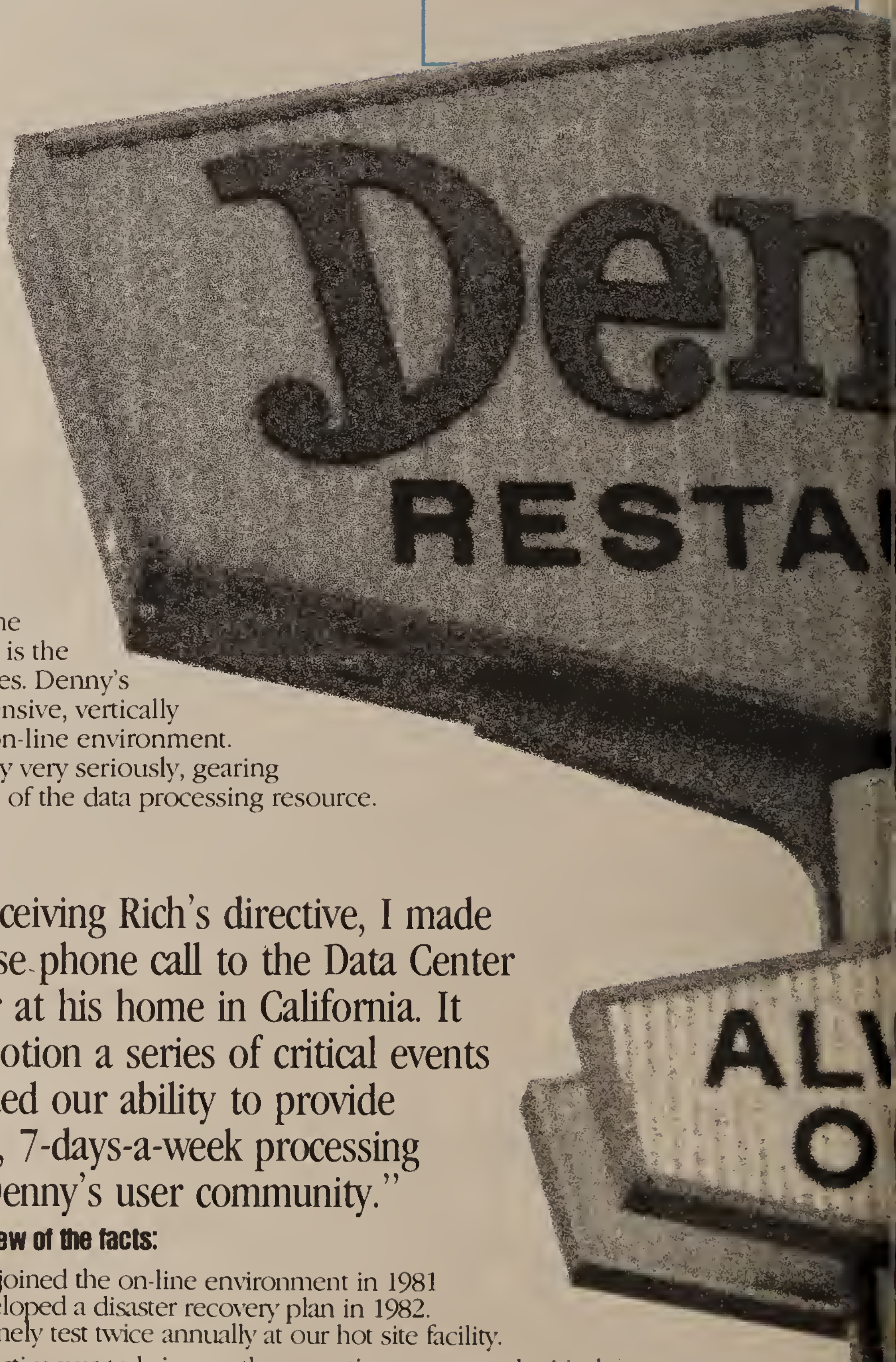
- Rapid inventory turnover demands that our supply lines remain clear at all times. These supply lines are critically dependent on on-line order entry processing.
- Denny's is an enterprise that deals with high volumes and moderate prices.
- Denny's operates on a weekly basis. In addition to daily polling of each restaurant to collect financial data, we issue weekly paychecks to 50,000 employees, and each of our 1,200 restaurant managers receives a weekly profit/loss statement.
- To protect our operating capabilities, Denny's Inc. management is committed to total redundancy in our data processing operations.

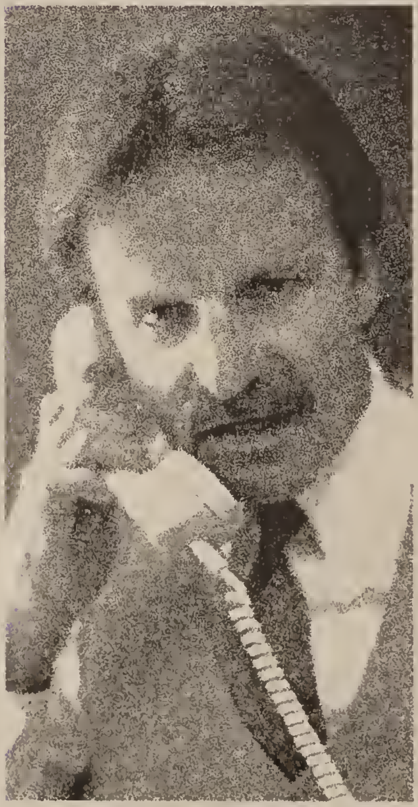
With over 1.3 Billion in total sales, our 1,200 Denny's restaurants play a major role in the success of the corporation. My primary concern is the success of the company's management objectives. Denny's restaurant operation is time-sensitive, labor-intensive, vertically integrated and exceptionally committed to an on-line environment. As a result, we take the issue of disaster recovery very seriously, gearing ourselves, from the top down, to the protection of the data processing resource.

**Denny's Inc. corporate data center:**

- processes over $20,000 in food and beverage sales weekly for each of our 1,200 restaurants.
- electronically captures payroll, cash and menu mix information from each of our 1,200 Denny's restaurants weekly.
- processes over 70,000 deposit transactions daily.
- handles payroll and benefit transactions weekly for over 50,000 employees nationwide.



Every week, trucks from the Denny's Inc. subsidiary, Proficient Food Company, deliver average food orders of over $5,000 to each of 1,200 Denny's Restaurants nationwide. All ordering and distribution is processed on-line through Denny's corporate data facility.



**Evan Wride**
Director,
Systems Development
Denny's Inc.

"After receiving Rich's directive, I made a surprise phone call to the Data Center Manager at his home in California. It set in motion a series of critical events that tested our ability to provide 24-hour, 7-days-a-week processing to the Denny's user community."

**Here are a few of the facts:**

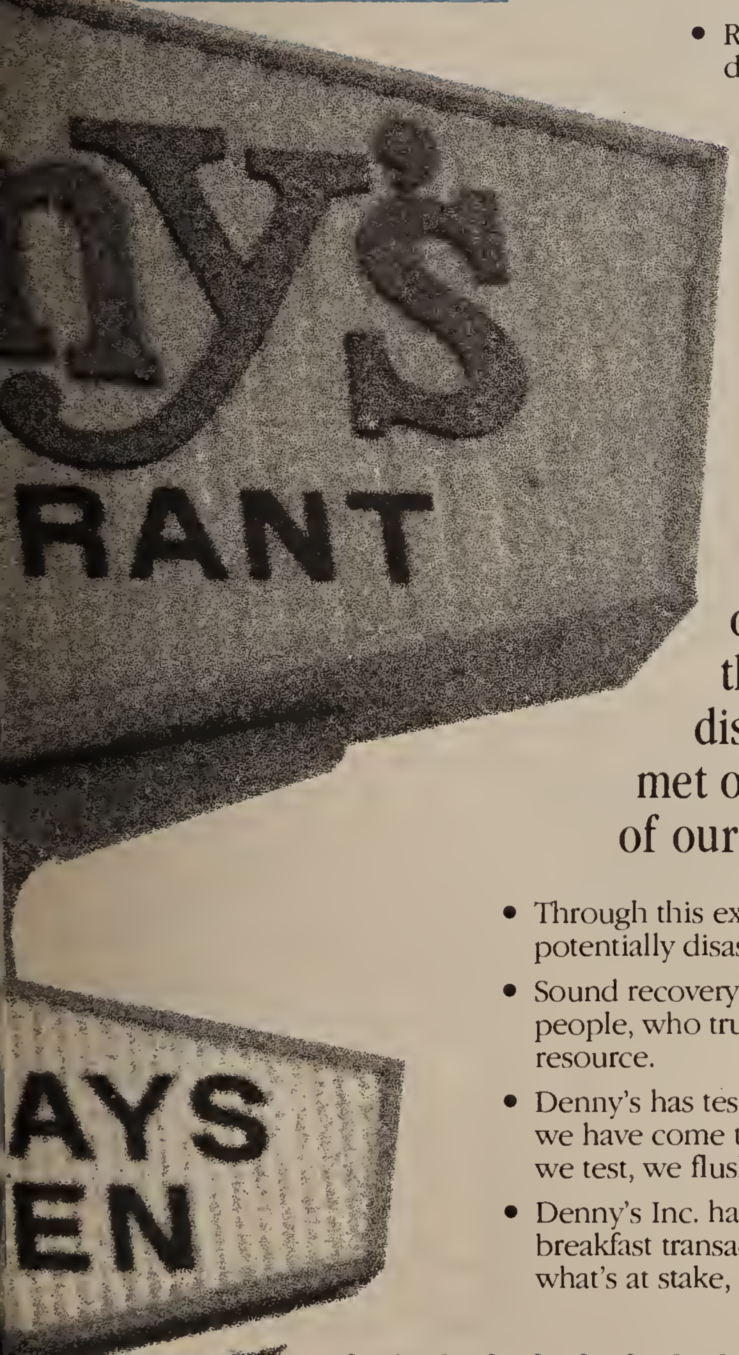
- Denny's joined the on-line environment in 1981 and developed a disaster recovery plan in 1982. We routinely test twice annually at our hot site facility.
- Our objective was to bring up the operating system and critical applications at the disaster recovery facility within 24 hours of a disaster.
- We wanted to test our recovery plan and the ability of our personnel to move quickly to the critical path of our recovery effort.
- Within four hours, three disaster recovery teams had been dispatched and were enroute to two destinations with their responsibilities firmly in hand.

Our ability to provide continuous data processing demands broad redundancy throughout the data center. That is in place. But Denny's Inc. is committed to *maximum* management of the risks of a computer disaster. For us, hot site backup is just another level of redundancy beyond the data center — another important layer of protection for our business.

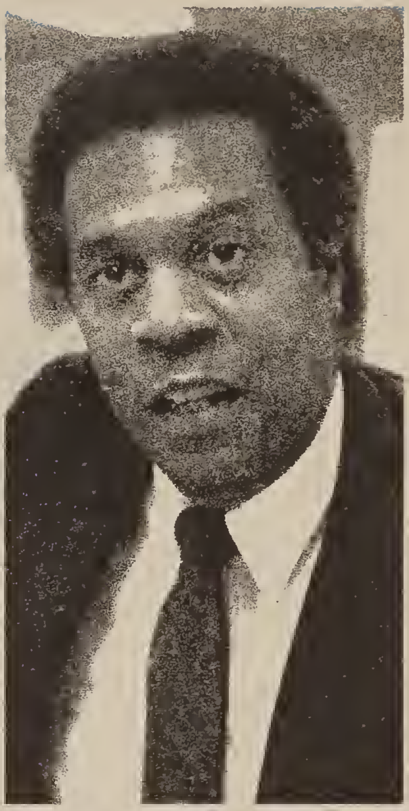
# 19, 1985, a disaster was porate data center.

**In one year, Denny's 1,200 restaurants serve more than 90 million breakfasts to the American public. That requires ordering, procurement, delivery and preparation of approximately:**

- 7.5 million lbs. of coffee
- 264 million eggs
- 7 million loaves of bread
- 21 million lbs. of bacon and sausage
- 10 million lbs. of pancake mix
- 2 million gallons of milk



**Shepard James**
Data Center Manager
Denny's Inc.



"When I received Evan's call at 3 a.m., I first picked myself up off the floor. Then I immediately put in action our disaster recovery plan."

**Here are a few of the facts:**

- We had planned, strategized and tested. Now it was time to find out how effective we could be in the face of an unexpected shutdown.
- It was my responsibility to alert and dispatch our personnel with specific directives that would allow us to bring up the operating system and critical applications at the Recovery Center within 24 hours of the "disaster."
- Reestablishing user access was critical, since 1,200 restaurants were depending on us to keep them functioning.
- Along with general operating concerns, we were specifically interested in our ability to back up our communications network at the Recovery Center.

Once we had established the critical path and our teams had arrived at the Recovery Center, we were able to bring up the MVS operating system, run diagnostics on our communications equipment, and begin processing critical applications according to schedule. We knew we were well prepared, but nothing validated our ability to respond as well as the real-world dynamics of this experience.

**Richard Kislowski**
Vice President,
Information Services
Denny's Inc.

"Within 22 hours of declaring the "disaster," our operating system was up and running, thanks to proper planning and a capable disaster recovery resource like CDRS. We met our objectives and honed the capability of our seasoned disaster recovery team."

- Through this experience, we reaffirmed our ability to conduct business under potentially disastrous circumstances.
- Sound recovery procedures are especially important to our division operating people, who truly recognize the importance of protecting the data processing resource.
- Denny's has tested its plan six times in the past three years. As a result of that, we have come to believe that testing is as important as planning. Every time we test, we flush out a new wrinkle.
- Denny's Inc. has committed the resources to ensure that we don't lose a single breakfast transaction. That may appear simplistic, but when you consider what's at stake, disaster recovery simply makes good business sense.

*Denny's Inc. is one of the more than 625 corporations for whom Comdisco Disaster Recovery Services, Inc. provides disaster recovery services. Their experience and concern is similar to that of many companies seeking bottom-line assurance through a dependable contingency resource. CDRS is pleased to be able to share their story.*

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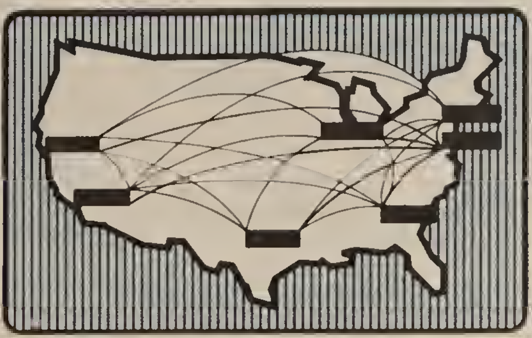

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# Your style as manager

From page 51

ment team, trusting his management proficiency and hard work would promote his success. Unfortunately, he never saw that his style was contrary to the relaxed, sociable attitude of top management. Key discussions often took place over long lunches and decisions were made on the golf course or while socializing. Though the data processing manager was a peer on the organizational chart, he did not belong to the team responsible for running the company, largely due to a difference in style.

It should be noted, however, that when two opposite types can coexist the complementary strength can be great. Traditional examples are the thinker and the doer, word people and numbers people, people-oriented individuals and task-oriented ones. In a hiring situation, while we may be drawn to people like ourselves, it may be someone very different who would make for the best working team by complementing our abilities.

Personality and style affect not only our ability to get along with others but the very ability to perform certain tasks. This is seen best in the context of changing job needs. Several large data processing shops owe their success to managers who charted the shops' growth and inspired people to implement a vision.

When their companies' fortunes changed, however, and the task became one of caretaking, the drive to alter and improve was not consistent with the new need to control and fine-tune. The introduction of distributed processing and personal computers has had the same impact on control-oriented managers. Some who could not tolerate a more cooperative style appeared to be technically obsolete when, in fact, the problem was really an inflexible personality trait.

### Understanding yourself

With so many ways in which your style can work for or against you, it is important that you understand yourself. You can gain insight by asking yourself which tasks you like and do well and which you do not. Is there a pattern to your successes and disappointments? What people do you like and get along with and why?

The most dramatic use of personal skill assessment is when it leads to the need for staff changes. You may conclude that a subordinate just cannot work with you or that you cannot work for a certain company. However, that should be rare. Remember, all differences in personality are not bad — only those that lead to conflict and inefficiency.

For example, if a manager recognizes that a particular task requires a creative orientation that is not his strength, he may choose to delegate the task to someone with that trait or at least work with such a person.

In supervising others, a data processing manager may be concerned about subordinates who spend much of their day socializing. However, it may be that this is not only important to the employees but to how they get work done. If this is only in conflict with the manager's ideas about proper work, perhaps an objective yardstick can be established to ensure that the important things are getting done.

However, if the behavior is contrary to the beliefs of top management, co-workers, customers or others, then no yardstick will be able to measure the potential disruption. Clearly, the only remedy is action such as closer supervision, environmental change or job reassignment.

The essential thing to remember is that data processing and personality are not contradictory terms. Computer management and personal style are not mutually exclusive. Even though we work in a world noted for precision and scientific method, it is ultimately people who make it work. Therefore people are the most important thing to understand — beginning with ourselves.

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# Taking care of business

From page 51

vice-president for corporate operations.

Cross's responsibilities range from telecommunications to decision-support systems, with the major resource being a 12,000-node network that links nearly 60,000 employees through electronic mail and various applications.

He also chairs a corporate information systems management committee made up of information systems subordinates, local information systems site managers and senior executives from various geographical and functional areas.

The committee directs corporate information systems planning and budgeting while trying to maintain what Cross calls strong reporting relationships within the operating units.

Cross speaks of accomplishments in his current role strictly in terms of benefits to DEC's manufacturing and marketing activities. Improvements in managing materials increased the number of times inventory is turned over per year from 1.8 to more than three. Enhancements in managing orders cut the time between placement and confirmation by more than half.

Using artificial intelligence to configure complex orders reduced the number that are changed, which cut costs and enhanced customer satisfaction.

Cross says he believes his move from line management to corporate information systems — with its responsibility across the entire corporation — enhances his career prospects at DEC.

"I get a very cross-organizational perspective about how the business works," he says. "Some of the metrics we use to measure ourselves are what's happening with inventory turns, what's happening with accounts receivable, what's happening with the company's overall asset management."

Cross recommends that other line managers work in information systems to broaden their perspectives and that information systems managers likewise work in line positions, even moving from one function to another, which he says is increasingly possible with the decentralization of processing.

Cross also suggests that information system managers trying to acquire general business knowledge take courses in areas such as management and finance. "It's appropriate to get some good old-fashioned education to any extent that's possible," he says.

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# Boston users enlightened

From page 51

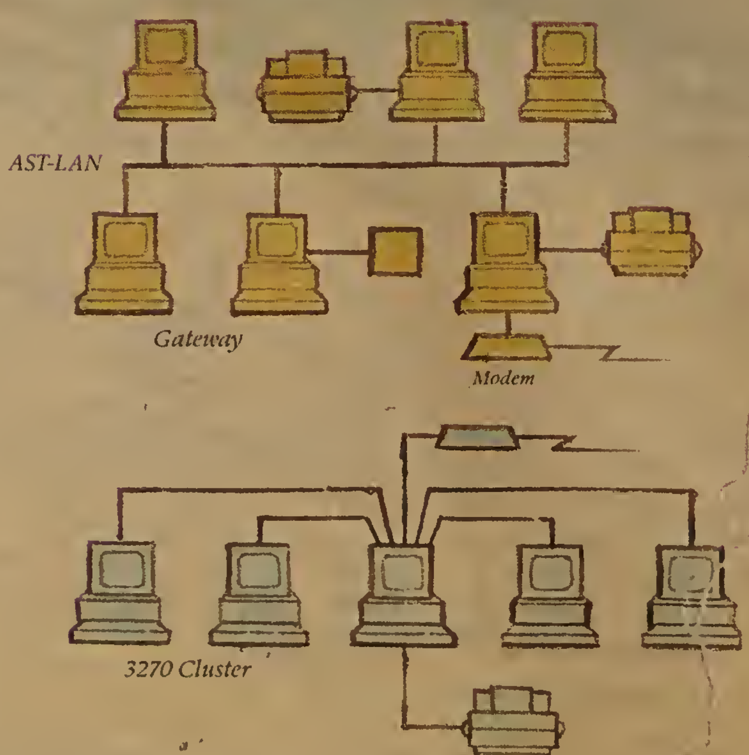
ing was closed, although workers were allowed to retrieve items they needed.

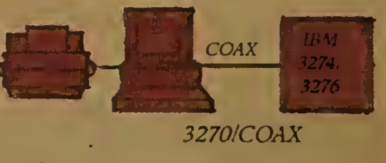
While most businesses had to operate out of other branches or share facilities with beneficent companies, one firm, Putnam Cos., a pension and mutual fund manager, moved to a prearranged disaster-recovery hot site.

Putnam Investor Services, Inc. — a subsidiary of the $34 billion Putnam Cos. — protected its securities trading by retrieving up-to-date backup data from an off-site vault and rushing it to a Sungard Data Systems, Inc. hot site in Philadelphia. For the next week, Putnam ran its IBM 4381 operations at the hot site through its Quincy, Mass., branch.

Putnam had grown big enough five years ago for its managers to provide for disaster recovery for the home office, but no such safeguards had been arranged for some smaller offices in the building, prompting managers there to consider the risks they face.

On the five floors of offices of the accounting and consulting firm Coopers & Lybrand, there was smoke damage but no loss of equipment or data, according to Barry Davis, microcomput-





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ing facilities coordinator. But had the fire actually entered the offices, the firm would have lost all the disks for roughly 65 microcomputers, which are used primarily for client work — audits, analysis of audits and spreadsheet applications.

Coopers & Lybrand stores hard copy and tapes from its Digital Equipment Corp. VAX minicomputer off-site but does not have remote storage for backup diskettes, Davis says. The firm has insurance for the equipment and could reorder the software, but any data on disks would have been lost.

### Backup advice

"If you can store diskettes, store them in cases and cabinets so the sprinklers won't ruin them, at the very least," Davis advises. "You should have them backed up off-site, but it's one thing to say that and quite another to get it done."

Davis says he finds that even getting PC users to make a duplicate copy is difficult. "If somebody spends two to three days working up something on Lotus Development Corp. 1-2-3 and the disk goes, it is their responsibility," he says.

At Craig & Mac Cauley Professional Corp., a law firm on One Post Office Square's 22nd floor, occasional shutoffs of electricity at the building had made Pauline Hanson wary. As the assistant administrator of a Wang Laboratories, Inc. VS15 word processing installation, Hanson had decided on the Sunday before the fire to keep everything backed up in an on-site vault.

After the fire, workers were able to retrieve stored backup from their offices and continue working at another law firm with a bigger Wang system. "If we weren't allowed back into the building, there would have been nothing we could possibly do," Hanson says.

She has made a disaster recovery plan a priority for the near future. Her firm is moving to another building and, as soon as it is settled, she hopes to convince executives to cover themselves against loss. "We use the Wang to do briefs, litigation, wills and trusts. If they were destroyed, we would be in serious trouble," Hanson adds.

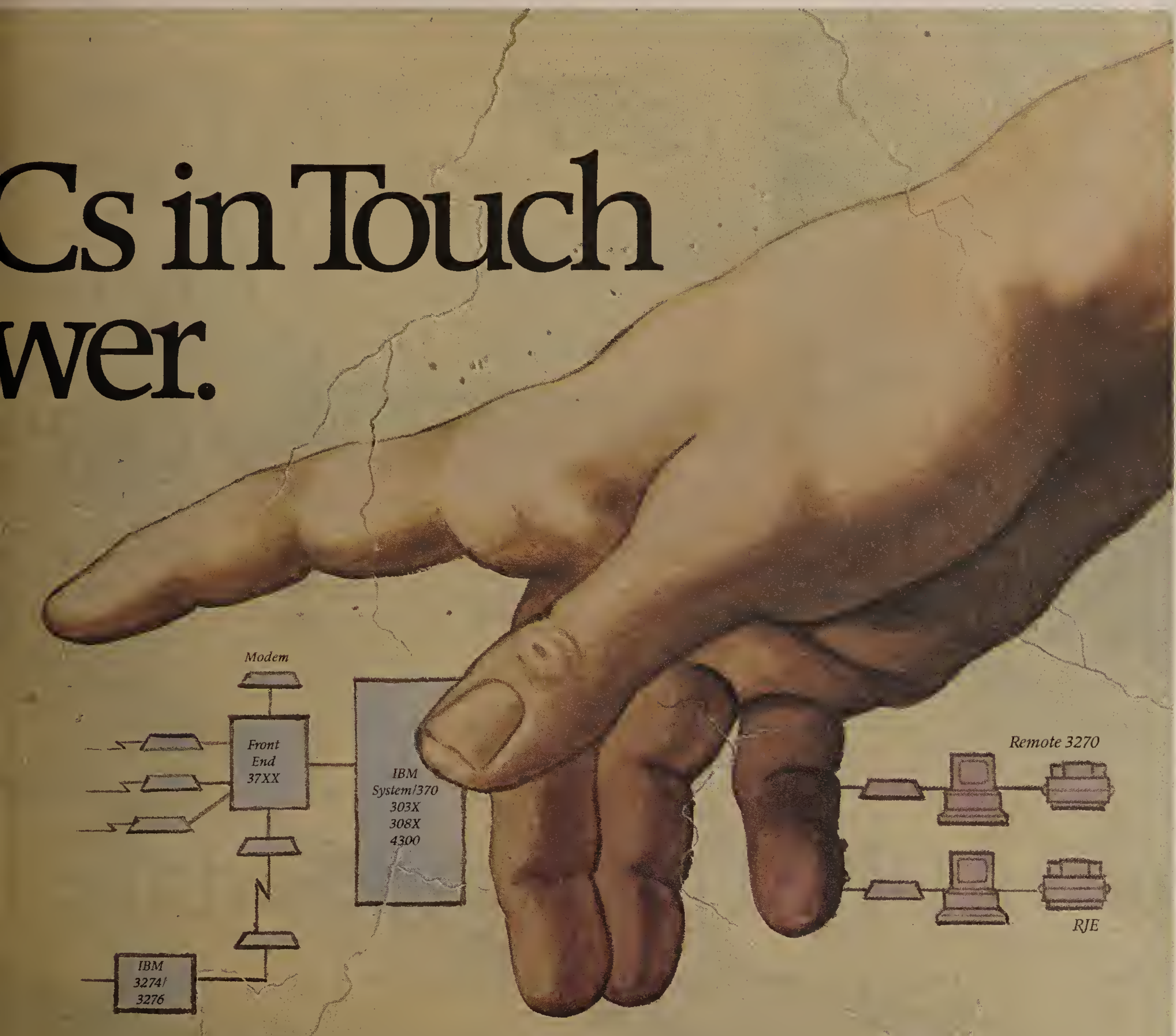
Disaster planning should be senior management's charge, according to a recent report by the National Bureau of Standards. "Senior management must take responsiblity for the planning, funding, implementation, testing and certification of an alternate processing strategy," the report says.

### Assigning responsibility

Top executives should assign management responsiblities for developing alternate processing strategies, demonstrate a dedication to developing and supporting the plan, commit the necessary resources, monitor development and require and verify periodic testing of the strategy, the report adds.

Alternative strategies can range from enrollment in dedicated disaster recovery centers or shared contingeny centers at the top end to a reversion to manual processing as the last resort. An individual company's risk assessment efforts will show what level of coverage is necessary.

Reverting to manual processing is not a likely alternative for any large or medium-size company, Hoey notes. "In most cases, the people who know how to do that are retired or dead. The company wouldn't have a mainframe if it were possible to do it manually."



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# NEW PRODUCTS

## PC network tool compatible with Netbios

Server Technology, Inc. in Sunnyvale, Calif., has announced Easylan Version 3.0, an IBM Netbios-compatible version of its personal computer network software.

Easylan 3.0 is said to allow personal computer users to run application programs written to IBM's network interface standard over RS-232C serial communications links and to develop Netbios-compatible local-area network (LAN) applications.

According to a company spokesman, Easylan 3.0 interconnects up to 20 IBM Personal Computers, PC XTs, ATs or compatibles.

The Netbios interface defines four basic network functions — send, receive, connect and disconnect. Because Server Technology has implemented Netbios through software and the PC's RS-232C serial communications ports, a network program coded to use the Netbios 5C interrupt will operate with IBM's PC Network, the IBM Token-Ring network and other LANs that support the Netbios interface, the spokesman added.

Easylan Version 3.0 also incorporates four new network commands in addition to the DOS-like EZDIR, EZCOPY, EZTYPE, EZDELETE and EZRENAME. The commands are EZCLOCK, for setting the network time from one date and time board; EZBEEP, for signaling other users through the PC's speaker when a file is about to be transferred or when a file transfer is complete; and EZMD and EZRD, allowing one user to make or delete subdirectories on another interconnected PC.

Easylan Version 3.0 supports commonly used single-user programs such as Lotus Development Corp.'s 1-2-3 and Ashton-Tate's Dbase products.

The single-copy price is $99.95. A two-PC kit is priced at $219.95. Additional single-user add-ons cost $119.95. Existing users of previous versions can upgrade to Version 3.0 for $25, the vendor said.

## Screen painting facility debuts

### Designs and manages CICS screens on micros

Micromain Software, Inc. in Duxbury, Mass., has announced an IBM CICS screen painting and design facility for the IBM Personal Computer.

Called Micromain Painter, the software has the ability to build maps and create IBM's Basic Mapping Support (BMS) code on the PC for use in mainframe CICS applications, according to the vendor.

Micromain Painter is said to be a fully operational, menu-driven mainframe-style utility for designing and managing screens.

#### Multiple utilities

The product incorporates utilities for handling, listing and testing files that contain screen designs and generated BMS code.

According to the vendor, the product features the ability to design CICS mainframe screens on IBM PCs or compatibles. It is also said to be able to store, modify, save design and generate the BMS code for use in the mainframe applications.

#### Extended attributes

The BMS code includes extended attributes, color and multiple-map mapsets. The BMS source code is uploaded for a PC file for use in the CICS application, the vendor said.

Micromain Painter also features an import facility to accept screen designs from other sources such as word processing systems and an export facility to include screen images in documentation.

Micromain Painter costs $495, the vendor said.

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## Technical publisher upgrade handles complex documents

Interleaf, Inc. in Cambridge, Mass., has announced the first customer shipments of its Technical Publishing Software (TPS) Release 3.0.

According to a company spokesman, TPS used to be primarily an office automation product. On the other hand, the spokesman continued, Release 3.0 focuses on productivity enhancements for users who create long, complex documents such as technical manuals, directories and books.

Features of Release 3.0 include editing and formatting control of text within graphics; revision tracking; an equation package; and a book facility for long-document assembly, including automatic numbering and cross-referencing.

This numbering and cross-referencing feature also has the ability to automatically generate an index and a table of contents, according to the vendor.

Other features of Release 3.0 are said to include additional computer-aided design interfaces, isometric and freehand drawing, additional graphics input options including line-art scanner and tracing tablet, enhanced software for editing images and new typefaces.

#### Can be bundled with workstations

TPS Release 3.0 is available bundled with 32-bit workstations manufactured by Apollo Computer, Inc., Digital Equipment Corp. and Sun Microsystems, Inc., according to the vendor.

An entry-level configuration including Apollo, DEC or Sun workstation, standard TPS software license and an Interleaf laser printer is priced at $29,900.

Unbundled TPS costs $15,000 per license, the vendor said.

## Server ups Unix users' speed

Informix Software, Inc., based in Menlo Park, Calif., has announced the release of Informix-Turbo, a specialized data base server said to increase transaction processing speed and provide fault tolerance.

According to a company spokesman, Informix-Turbo was designed to provide Unix-based system users with the ability to handle heavy online transaction processing without increasing the risk of information loss.

Informix-Turbo is an optional data base server that uses AT&T Unix System V shared memory, query optimization techniques and raw I/O capability to manage data and speed access for users. A system administrator can use expert-system technology to modify parameters that affect the performance of the system for a particular application environment.

To implement fault tolerance, Informix-Turbo bypasses Unix to insert, read and update data directly on the disk rather than buffering the information in internal memory and writing it onto the disk later. The server keeps transaction logs of the writes so that if there is a system failure, it can use its logs to restore the data base to the last transaction processed. The logs also enable Informix-Turbo to maintain data consistency across multiple tables.

Informix-Turbo is priced from $1,200. It requires Unix System V shared memory and, because it is a data base server, must be used with another Informix product or application as a front end.

According to the company, all current applications written with Informix-4GL, Informix-SQL and other Informix products can be used with Informix-Turbo.

Informix-Turbo will be available in March.

## Prime unveils Common LISP

### Language integrates with system software

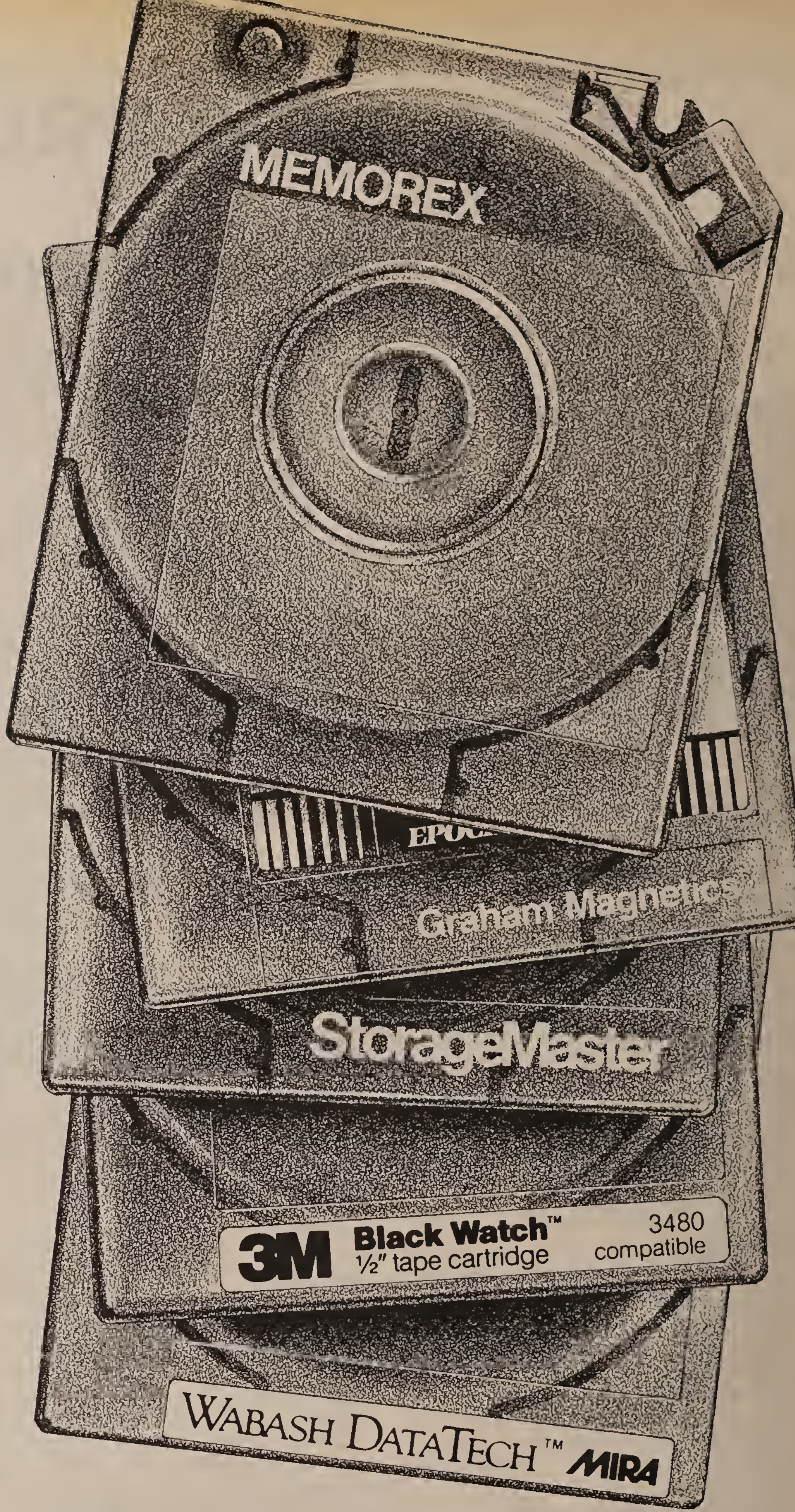
Prime Computer, Inc. of Natick, Mass., has announced the availability of the company's proprietary implementation of the industry standard Common LISP programming language for Prime general-purpose superminicomputers.

Called Prime Common LISP, the programming language is said to be fully integrated with Prime system software. According to the vendor, users can develop and execute artificial intelligence and symbolic computing applications on 50 series systems, such as portfolio management, environmental quality control, mining and exploration strategies, numerical control tooling and flexible manufacturing systems.

In the stand-alone development environment, Prime Common LISP users can develop, compile and debug LISP programs interactively. With the runtime system, users can execute applications independently of the development environment.

Prime Common LISP interfaces to Prime languages, the Primos operating system and other Prime system utilities. Users can exchange data between application programs and incorporate existing data bases into their LISP programs.

Prime Common LISP is user installable. It requires Revision 20.0 of Primos. For Prime office systems, the development environment costs $8,400; for $10,500, it comes packaged with the Emacs full-screen text editor. For computer-room systems, the development environment is priced at $12,000 and at $16,000 with Emacs. The Prime Common LISP runtime system costs $4,000 for all Prime systems.



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# SOFTWARE & SERVICES

## Systems software

**Cambridge Systems Group** has introduced **ACF2/VM Release 3.0**, an enhanced version of its data security software for VM users.

Release 3.0 is said to provide enhanced security for the CP DIAL command, allowing a virtual machine to be secure from unauthorized DIAL access. Under Release 3.0, the installation has the option to validate logons of FORCEID users and write individual rule sets for each DIAGNOSE instruction controlled by ACF2/VM.

ACF2/VM Release 3.0 does not require source code modification for VM Control Program modules.

ACF2/VM Release 3.0 costs $24,000. Current users may upgrade for free.

Cambridge Systems Group, 1333 Lawrence Expwy., Santa Clara, Calif. 95051.

## Applications packages

**SCS, Inc.** has announced an IBM Manufacturing, Accounting and Production Information Control System-interfaced **quote-estimating system**.

The system allows users to determine final price estimates using any cost variables specific to their business and to print quotes that can be sent to customers and maintain a quote history. It also provides a Help text for on-line documentation.

The quote-estimating system costs $3,200.

SCS, Suite 300, 201 S. Main St., N. Syracuse, N.Y. 13212.

## Software languages

**Celerity Computing** has announced the availability of the **LISP** artificial intelligence programming language for its Unix-based 32-bit computer systems.

The Franz LISP dialect offered allows multiple users to run large-scale AI applications, such as the Department of Energy MACSYMA. Celerity's LISP has been optimized to take advantage of the University of California at Berkeley Unix version operating system.

Celerity's Lisp costs $7,000.

Celerity Computing, 9692 Via Excelencia, San Diego, Calif. 92126.

# MICROCOMPUTING

## Software enhancements

**Kartech Data Services, Inc.** has announced **Release 1.8** of its **PC-Proto**, a systems prototyping tool.

PC-Proto allows users to create a working model of a system on an IBM Personal Computer, PC XT, AT or compatible. It also provides access to files and data bases and features include enhanced cross-reference reports and an enhanced file converter.

PC-Proto costs $249.

Kartech Data Services, 165 Pinewood Ave., Toronto, Ont., Canada M6C 2V6.

## Communications

**Consumers Software, Inc.** has announced an entry-level version of its **Network Courier** electronic-mail program for personal computer local-area networks.

The program was designed for networks with up to six personal computers. It provides the same functionality of the standard version and the ability to share files without exiting application programs.

The entry-level version of Network Courier is priced at $295.

Consumers Software, Suite A, 8315 Monterey St., Gilroy, Calif. 95020.

## Data storage

**CMS, Inc.** has announced the **K-Kit 60**, a 60M-byte hard disk drive subsystem for the IBM Personal Computer XT.

The drive features an average access time of 28 ms., a transfer rate of 5M bit/sec. and required operating power of 29 watts.

The subsystem comes formatted for installation and includes controller card, cables and mounting hardware.

The K-Kit 60 costs $1,595.

CMS, 3080 Airway Ave., Costa Mesa, Calif. 92626.

# NETWORKING

## Protocol converters

**Datagraf, Inc.** has announced the **Honeywell VIP 7700** and **VIP 7800 protocol converters.**

The protocol conversion packages are said to convert terminal protocols of other manufacturers, such as IBM, Burroughs Corp. and Sperry Corp. , to emulations of the Honeywell, Inc. terminal protocols. It is said to allow for communications with Honeywell mainframes as well as associated front-end processors.

The Honeywell conversion packages are available in Series II and Bump protocol converter configurations. Prices start at $3,300.

Datagraf, 8305 Highway 71 W., Austin, Texas 78735.

## Software

**Communications Research Group** has announced **Blast Host**, a software product designed to allow mini or personal computers to connect to mainframes.

Blast Host runs under IBM's VM/CMS and MVS/TSO operating systems using any asynchronous pathways found in the mainframe environment, such as protocol converters and CCITT X.25 pads. It operates as an application program to connect

Continued on page 62

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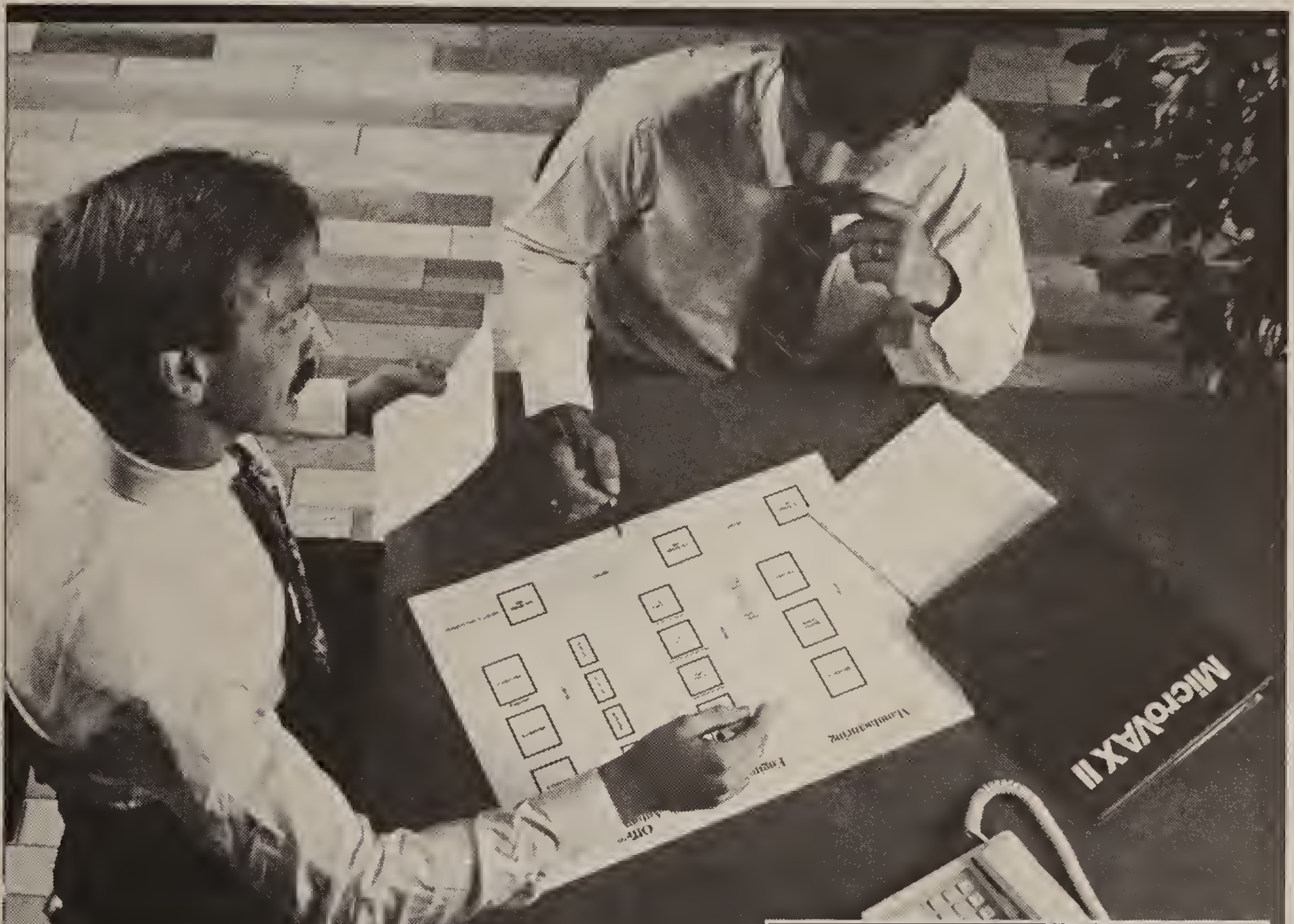

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Continued from page 61

PCs or minis to a remote host and transfer files between systems.

Features include IBM 3270 terminal emulation, asynchronous connectivity and automatic connection to host mainframes or minis dialing public-network pads.

Blast Host is priced at $5,500.

Communications Research Group, Third Floor, 5615 Corporate Blvd., Baton Rouge, La. 70808.

### Multiplexers/Modems

**Franklin Telecom** has introduced the **FM-2400E** and the **Bright modems**.

Both are said to be Hayes Microcomputer Products, Inc.-compatible. The FM-2400E operates at 24K bit/sec. It offers asynchronous or synchronous transmission.

The Bright modem is a full-function modem that fits into the short slots of the IBM Personal Computer and compatibles. It operates at 12K bit/sec. and has auto-answer, pulse or touch tone auto-dial, automatic speed selection and switch-selectable settings for COM1/COM2 ports.

The FM-2400E costs $460. The Bright modem costs $149.

Franklin Telecom, 31320 Via Colinas #113, Westlake Village, Calif. 91362.

## SYSTEMS & PERIPHERALS

### Turnkey systems

**General Computer Corp.** has introduced the **Script Manager II**, a stand-alone system designed for use in pharmacies.

The Script Manager II features computer assistance in filling and refilling prescriptions; third-party billing through the vendor's central billing service or through roster billing; monitoring for allergic reactions as well as for conditions against the medications being dispensed; patient profiles; itemized formulary; reordering; and reporting tools, according to the vendor.

The Script Manager II is available for lease for $259 for 60 months or $299 for 48 months.

General Computer, 2045 Midway Drive, Twinsburg, Ohio 44087.

### Processors

**Imaging Technology, Inc.** has added the **HF-150 Histogram/Feature Extractor** to its Series 150 and 151 product lines.

The HF-150 is a Motorola, Inc. VMEbus-compatible, dual-function board said to perform both histogramming and feature extraction at real-time video rates. Features include the ability to accelerate the execution of image processing functions.

The coordinates of up to 16 features can be recorded simultaneously. The output buffer can hold up to 16,000 distinct features.

Histograms are performed on 10-bit image data.

The HF-150 with one output buffer costs $2,395; with two it costs $2,895.

Imaging Technology, 600 W. Cummings Park, Woburn, Mass. 01801.

### Terminals

**Informer Computer Terminals** has announced its **207-102** portable workstation.

The 207-102 is said to connect a Digital Equipment Corp. communications network to an IBM communications network through a protocol converter. It is said to be functionally equivalent to DEC's VT102 display terminal. It features direct RS-232C connection or an optional dial-up connection to the mainframe.

The unit features a 9-in. display with a flip-down keyboard; switching between 80 and 132 columns; and an external asychronous ASCII printer port.

The basic Informer 207-102 costs $1,390.

Informer Computer Terminals, 12781 Pala Drive, Garden Grove, Calif. 92641.

### Printers/Plotters

**Wespercorp, Inc.'s Western Peripherals Group** has introduced the **DLP-3000** printer protocol converter said to support Hewlett-Packard Co. HP300 minicomputers.

According to the vendor, the DLP-3000 provides a standard RS-232 serial connection on the printer side while returning emulation of the HP 2631B or 2930 series printers to the host.

The device's HP emulation also supports the HP 3000 MPE spooler for remote-spool printing. It also works with parallel-to-serial converters.

Other attributes of the printer protocol converter include built-in diagnostics and error detection and correction of print files.

The DLP-3000 is priced at $900.

Wespercorp, 1821 E. Dyer Road, Santa Ana, Calif. 92705.

## PRICE REDUCTIONS

**Ampex Corp.** has reduced the price of its **Ampex 220** video display terminal.

The Ampex 220 is an American National Standards Institute terminal said to be compatible with Digital Equipment Corp. VT220, VT102, VT100 and VT52 protocols. It features 400 bytes of nonvolatile programmable function-key memory, a programmable user line, function key loading, VT220-compatible keyboard, downloadable character sets, block mode and a Compose character key.

The Ampex 220 is now priced at $529.

Ampex, 401 Broadway, Redwood City, Calif. 94063.

WALKER HELPS KEEP THE PEACE AT PENNSYLVANIA GAS AND WATER

"While many packages satisfy user requirements, Walker also satisfies data processing objectives. Eliminating conversions each time our computer environment changes gives us a competitive advantage."

David A. Miller
Director of Data Processing
Pennsylvania Gas and Water (PG&W)

Data Processing Director David Miller maintains a peaceful coexistence between users and data processing personnel at Pennsylvania's $230 million utility by training both groups in Walker's financial application packages.

"We solved two distinct sets of requirements, without making tradeoffs," says Miller.

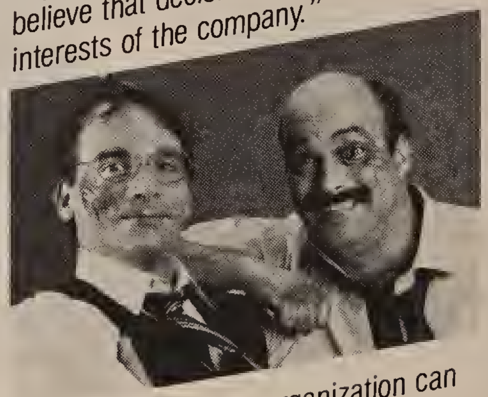
USER NEEDS: "It was important that users begin to control the systems supporting their business activities," explains Miller. "With Walker products, users work with high level tools to interactively tailor screens and reports to match PG&W's business requirements. Once the application is installed, users control the majority of the application's processing," says Miller.

DP NEEDS: Experience told Miller that hardware and software changes were inevitable: "In the '70s we experienced numerous changes in the company's operating environment," he says. "We were determined to minimize the future effects of such changes by making prudent hardware decisions and by isolating application software."

Miller achieved his goals. Because Walker products run independently of operating, data base management, and telecommunications systems. Notes Miller: "We no longer perform costly conversions for our Walker-based products each time components in our operating environment change."

During the selection process, Miller looked beyond current package pricing. "We factored into product cost the expense associated with the total conversions expected over its useful life," says Miller. "We believe this type of evaluation presents a more valid view of an application's cost."

"Every time we review our decision to purchase Walker products, we still believe that decision was in the best interests of the company."



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And since it's a sync modem, the 4850PA is the ideal companion for every kind of remote device, including RJEs and PCs in micro-to-mainframe applications. You can even use it to lynk up your minis.

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# by resting on what's behind.

Somewhere along the way, a leader has to break away from the pack. And go it alone. That's what leadership is all about. Standing up, bearing down, and moving ahead.

**Breaking Away.**

Novell broke out of the local area networking (LAN) pack four years ago with the introduction of the file server. We called it a LAN milestone. Others scoffed. Three years later, when IBM announced that its LAN systems would be file server-based, the rest of the pack finally headed for that first milestone.

But Novell was already milestones ahead. By porting the NetWare® LAN Operating System to over 30 major LAN hardware systems and offering nearly 4,000 NetWare-compatible multiuser applications, Novell had established a de facto LAN standard. A standard now supported by more than 400,000 NetWare users worldwide.

And with the introduction of System Fault Tolerant (SFT™) NetWare, Novell passed another LAN milestone: affordable fault tolerance for nearly all LAN systems.

**Moving Ahead.**

Today, Novell isn't resting. On past achievements or anything else. While other companies are struggling to reach Novell's LAN milestones, Novell is forging an even bigger lead with new milestones like the Universal Network Architecture (UNA) strategy and the opening of NetWare Centers worldwide. A lead so big that many major LAN competitors are buying Novell technology just to stay in the race.

Being a leader is hard work. But Novell is in front to stay. Because nothing compares to the view from the front. Especially when you look forward to the milestones ahead.

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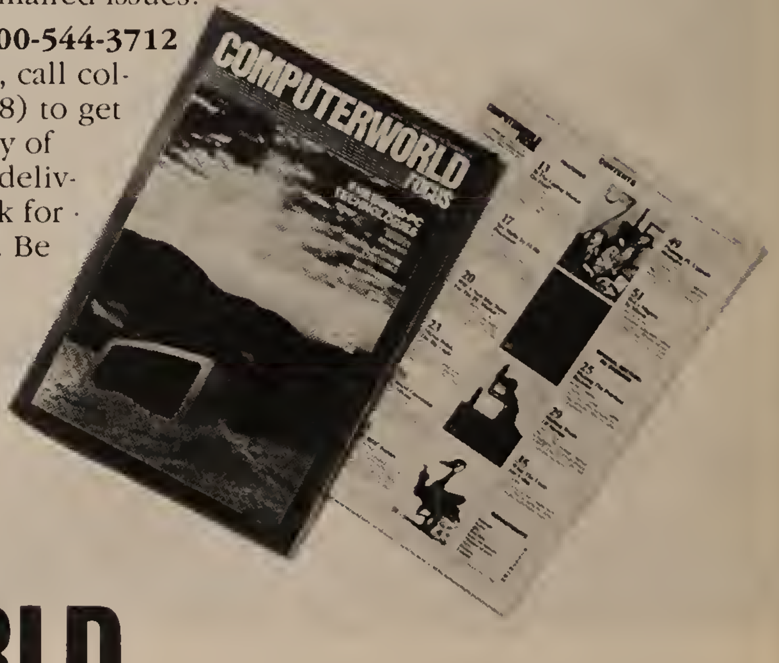

**COMPUTERWORLD**

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

# COMPUTER INDUSTRY

Section begins on page 94

# Third-party micro software support gains corporate attention

**By James A. Martin**

Just 18 months ago, third-party microcomputer software support companies were virtually nonexistent. Their numbers remain small, but analysts predict that will soon change and a new industry will emerge from several key developments in corporate computing habits.

As micros began to proliferate, the ranks of end users using sophisticated spreadsheet and accounting packages grew. The level of software support from vendors and corporate MIS departments, however, did not always keep up, and the promises of increased end-user productivity did not always materialize.

Last year, one major software vendor, Ashton-Tate, began charging fees for customer support after the initial warranty period, which some say is giving this fledgling industry a strong boost.

"I always thought this was an up-and-coming industry, and the fact that some software companies are now charging a fee for support has guaranteed it," says Amy D. Wohl, president of Wohl Associates, a consulting firm in Bala-Cynwyd, Pa.

Micro Support Resource Corp. (MSR) is one of the few companies now offering third-party software support nationwide for PC end users. After opening its Atlanta headquarters in September 1985, MSR has grown from seven employees in one office to 35 employees supporting some 6,000 end users. Revenue is expected to reach $1 million in 1986.

Other companies are beginning to show interest in third-party software support as well. Businessland, Inc. rolled out a nationwide program last June to offer a variety of third-party hardware and software support packages. Analysts believe it is only a matter of time before a large micro software vendor offers support of other vendor's products — just as hardware vendors such as Honeywell, Inc. and NCR Corp. have entered third-party hardware maintenance.

MSR's Fain

"We do for users what maintenance companies do for hardware — we keep them operational," MSR President Deborah Fain says. "Most companies tend to forget that the user, in terms of dollars, is more expensive than the hardware."

Last August, Ashton-Tate announced that its Systems, Service and Information Division sector would begin providing a range of support services from $50 to $150 per year per user for each software package supported. Other software vendors, seeing the profit potential, are expected to follow suit.

"By charging these fees, the software industry has opened a Pandora's box," Wohl says. Most software vendors do not have a good reputation for support, she says, and, as a result, customers are hesitant to pay for vendor support. "This gives folks like MSR a good chance, and I think there's room in this business for a lot of their type," Wohl adds.

On the other hand, some analysts see third-party companies facing an uphill battle in trying to support other companies' products.

"Third-party companies have to compete with the original provider for service," says D. R. MacNaughton, president of Business Development International, Inc., a consulting firm in Franklin Lakes, N.J. "They can compete on price, probably, but there is the assumption with a lot of people that the guys who wrote Lotus 1-2-3, for example, will be better at maintaining it than someone who didn't."

MSR says it can meet that challenge. Founded by Fain and three colleagues with whom she had worked in support and education at Samna Corp. and Lanier Business Products, Inc., the firm counts Coca-Cola Co. and Greyhound Lines, Inc., a subsidiary of Greyhound Corp., among its customers. MSR offers full telephone support for $150 per user per package for 20 calls on most major PC word processing, spreadsheet and data base software packages.

"There had to be a multivendor system in large numbers in the workplace for our kind of service to be viable," Fain explains. "Before, with office automation products, end users were used to getting all their components and support from one company, like Wang Laboratories, Inc. In the microcomputer environment, these components come from a variety of places."

"The days of manufacturers selling hardware at 35% off and giving free support are gone," according to Miles Walsh, director of Businessland's toll-free Solution Line telephone support service.

It is expected that at least one major player in the micro software industry will enter the market, maybe as early as middle or late 1987.

However, MSR is not worried. "If another company started today, it would take them at least two years to duplicate our data base, and in that time frame we think we can secure enough of the market share to maintain an edge," Fain contends. "If we do a good job, their entrance won't affect us dramatically."

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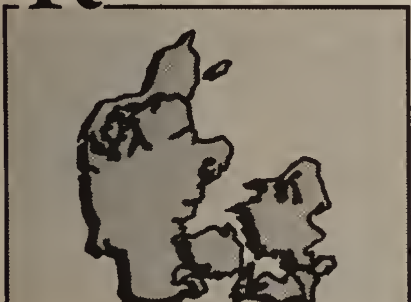

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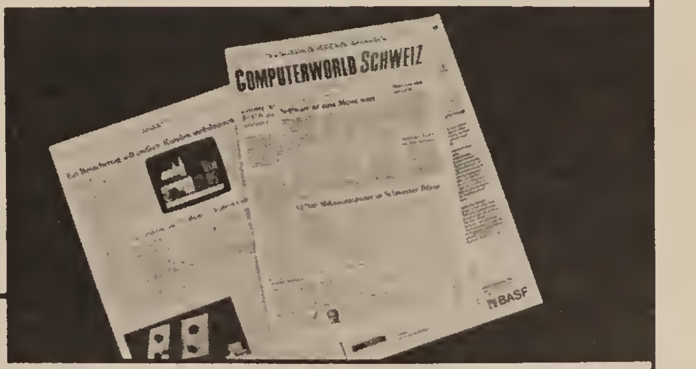

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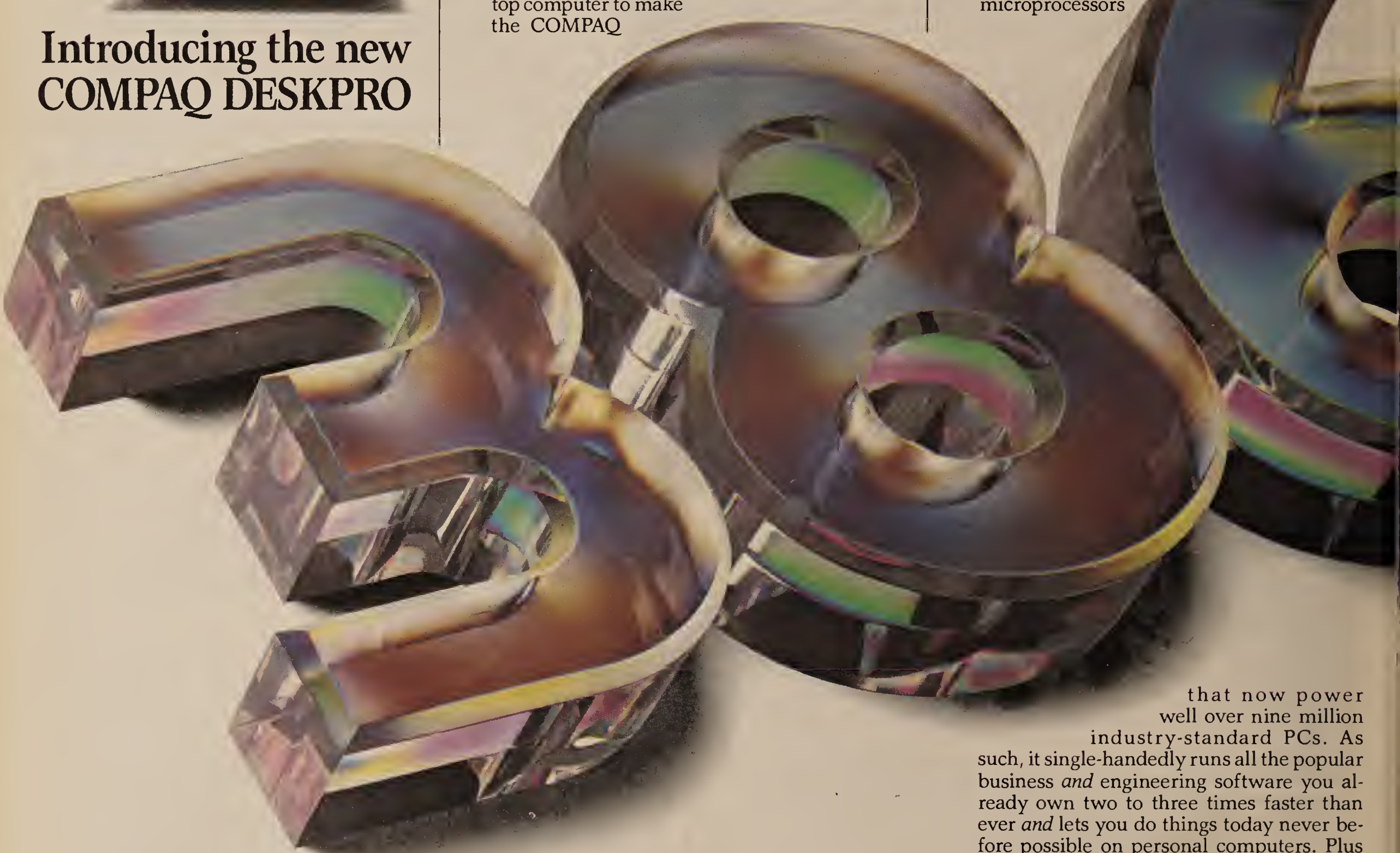
## Introducing the new COMPAQ DESKPRO



COMPAQ announces a major improvement to the industry standard, one that carries you far beyond the limits of today's "advanced-technology" personal computers. It's the new COMPAQ DESKPRO 386,™ and it reaches far higher levels of speed, compatibility, performance, and expandability than have ever been attainable in personal computers. Dozens of separate enhancements have been combined in one desktop computer to make the COMPAQ DESKPRO 386 the most advanced personal computer in the world. There's no personal computer more ideal for power users, networking and connecting to mainframes.

The new high-speed, 32-bit, 16-MHz Intel® 80386 microprocessor forms the heart of this breakthrough. It's the latest from Intel's family of microprocessors that now power well over nine million industry-standard PCs. As such, it single-handedly runs all the popular business *and* engineering software you already own two to three times faster than ever *and* lets you do things today never before possible on personal computers. Plus it's compatible with industry-standard

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# advanced-technology computers

hardware and expansion boards already available. But the chip is only the beginning of this story.

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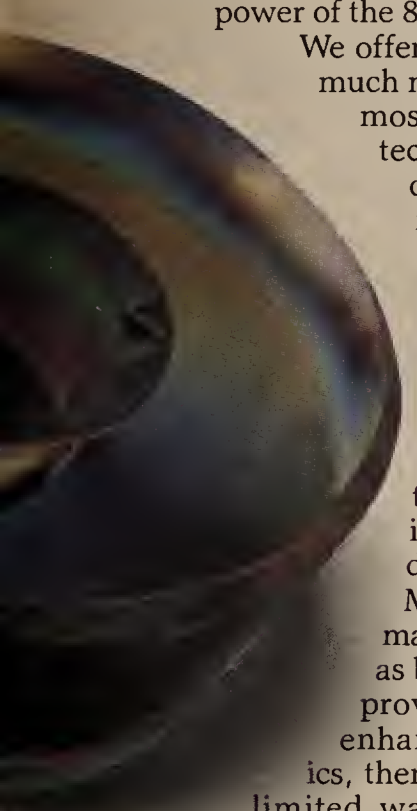
Performance enhancements go far beyond the microprocessor. Every component has been optimized to take advantage of the increased speed and power of the 80386.



We offer you, for instance, much more memory than most other advanced-technology personal computers. Plus more storage with faster access. A built-in lightpen interface. And even a built-in expanded memory manager.

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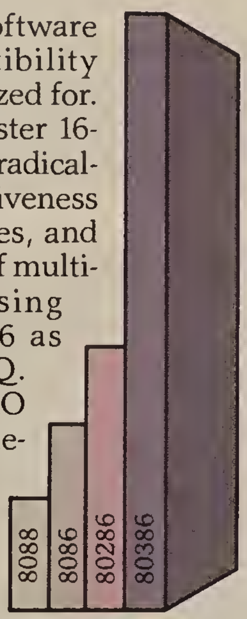
### The winning numbers

The new COMPAQ DESKPRO 386 features advanced 32-bit architecture that processes twice as much information as 16-bit computers in the same amount of time. Yet it retains the unparalleled software and hardware compatibility that COMPAQ is recognized for. Coupled with a much faster 16-MHz processing speed, it radically improves the responsiveness of spreadsheets, databases, and networks, and the ease of multitasking, especially using XENIX® System V/286 as published by COMPAQ. The COMPAQ DESKPRO 386 will also allow the development of powerful new business programs, more advanced engineering software, and artificial intelligence applications.

*The COMPAQ Color Monitor works with software designed for a wide variety of display standards: EGA, CGA, and monochrome.*



*The Intel 80386 microprocessor is faster and more powerful than its predecessors.*

### More of everything

Count on more memory, storage, flexibility, connectability and compatibility for starters. For instance, you can now break the 640K memory barrier *and* use up to 8 Megabytes of high-speed, 32-bit RAM with the COMPAQ Expanded Memory Manager. This software comes standard with the COMPAQ DESKPRO 386 and works with applications that follow the Lotus®/Intel/Microsoft® (LIM) Expanded Memory Specification, allowing you to build bigger spreadsheets, sort larger databases and run more programs.

Get up to 10 Megabytes of RAM without using a single expansion slot; up to 14 Megabytes in all. And get up to 4 internal storage devices. Now you can access even more data faster. Actually 50 to 150 percent faster with our 40-, 70- and 130-Megabyte internal fixed disk drives, the fastest in the industry.

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# Datapoint's future questioned as CEO leaves firm at crucial point

**By James A. Martin**

SAN ANTONIO — After several years of financial and management setbacks, the most recent being the sudden resignation of its president and chief executive officer, the future of Datapoint Corp. appears to be at its most uncertain.

The office automation and network vendor lost market share in recent years to mini and microcomputer vendors and reported operating losses in both fiscal 1985 and 1986. Before that, the company suffered lawsuits alleging the firm misrepresented financial results to its shareholders between 1980 and 1982.

In 1985, Asher B. Edelman, a Wall Street financier infamous for buying troubled companies and selling them off in pieces, gained control of Datapoint in a highly publicized corporate takeover.

In December 1986, Edelman appointed Clark R. Mandigo as president and chief executive officer of Intelogic Trace, Inc., the third-party computer maintenance concern spun-off from Datapoint by Edelman. With no experience in computer maintenance, Mandigo was chosen for his management skills [CW, Dec. 8].

If the company does not make headway in marketing and sales, the possibility is strong that Datapoint will "have to be merged, acquired or form a strategic alliance with another vendor just to survive," according to Andrea Rossi, analyst with Rossi Consultants in Marblehead, Mass.

### 'Dangerous point'

"Datapoint is at a dangerous point right now," according to Linda O'Keeffe, a director of market research at Dataquest, Inc. in San Jose, Calif. "Users have been nervous since the 1982 scandal and even more nervous since Asher Edelman stepped in. There must be a concerted sales and marketing effort and a unified product positioning strategy to energize sales if they are to survive."

Datapoint recently suffered a further blow with the unexpected resignation of 13-year executive and CEO Edward P. Gistaro [CW, Jan. 19]. Although Gistaro refused to comment on his departure and did not reveal to Datapoint his reasons for leaving, analysts and observers speculated that Gistaro often disagreed with Edelman's vision for the company.

Edelman referred press inquiries regarding Gistaro's departure to a Datapoint spokesman, who said that to his knowledge the two had a good relationship.

Several Datapoint users contacted by *Computerworld* said the company's recent problems have not necessarily translated to their own DP shops.

"Product-wise, the company is in the best shape ever," said David Prybys, director of MIS for Cadillac Gage Co. in Warren, Mich. "The question is, Have too many people been scared away?"

Dana Commercial Credit Corp. in Troy, Mich., however, is phasing out its seven Datapoint 8800 minicomputers in favor of an IBM 4381 mainframe.

"The growth of our company is why we're migrating to a mainframe," said James P. Jones, Dana's director of information services. "At the time we decided to upgrade, I didn't feel Datapoint had kept up with the technology curve. Over the last year, they've come out with significant technological improvements over what they had, but for us it was a day late and a dollar short."

Technological expertise will not be as important as marketing savvy in the search for Gistaro's replacement, according to Dataquest's O'Keeffe. "The new CEO had better be the world's best marketing executive, otherwise the company is going to continue to face tough times," O'Keeffe said.

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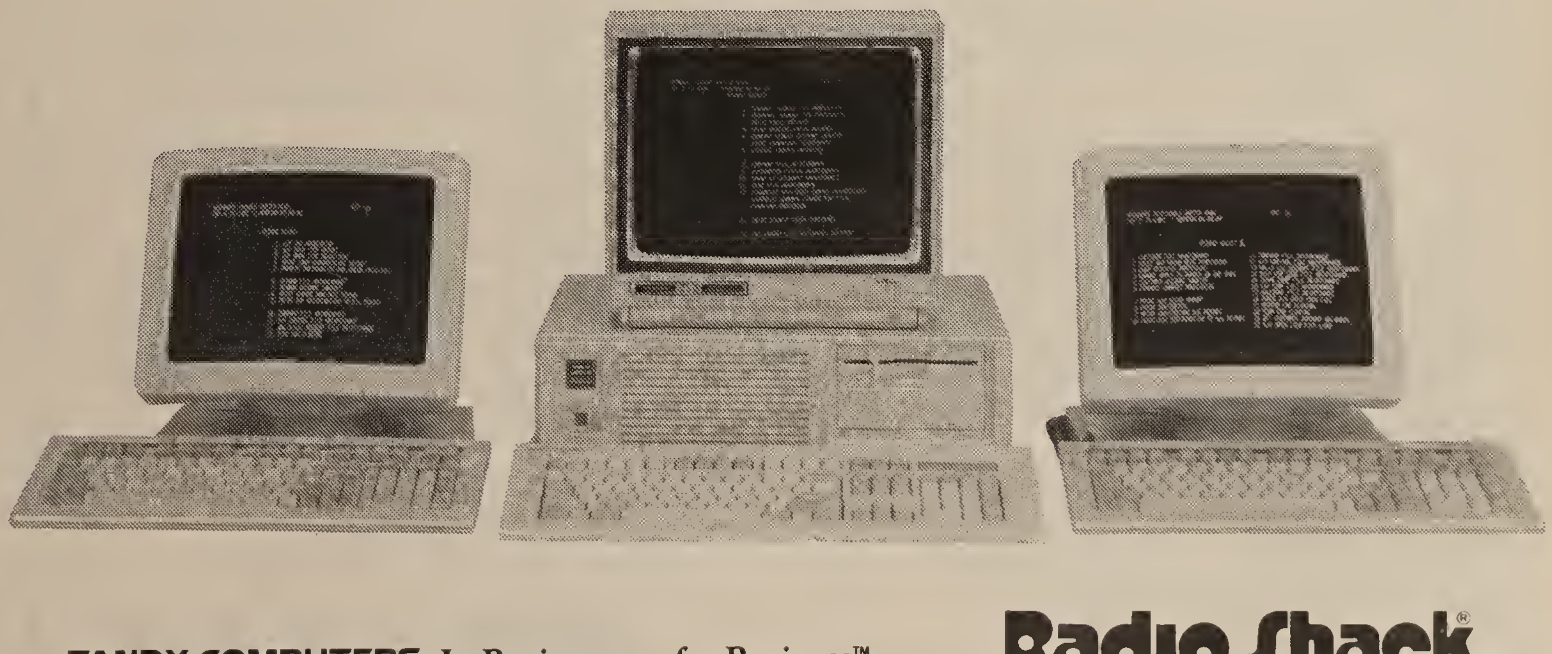

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# Apple, Microsoft, Tandy report rise in sales, earnings

## Stratus, Tandem gain while NCR growth stalls

**By Alan Alper**
**and Clinton Wilder**

Demonstrating that the worldwide microcomputer industry remains robust, Apple Computer, Inc., Microsoft Corp. and Tandy Corp. last week reported solid growth in sales and earnings in the quarter ended Dec. 31.

Three larger systems vendors targeting the transaction processing market, however, posted contrasting quarterly results. While Stratus Computer, Inc. and Tandem Computers, Inc. continued their recent success, NCR Corp.'s profit growth stalled on a 12% rise in revenue.

**Microsoft.** Spurred by healthy growth across all product areas, Microsoft registered second-quarter profits of $19.7 million, or 71 cents a share, up 80% from the corresponding period last year. Sales were up 52% to $49.9 million.

President Jon Shirley attributed the favorable results to strong sales through retail channels. He cited, in particular, strong demand for software products for Apple's Macintosh, such as Microsoft Works.

"Microsoft's systems products fell to below 50% of total revenue, which means that their applications products are contributing more," said Thomas Galvin, an analyst with Shearson Lehman Brothers, Inc. in New York.

**Apple.** Apple's traditionally strong December quarter, which in 1986 included a much higher percentage of Macintosh sales, boosted revenue 24% to $662.3 million. But profits grew by only 3%, reflecting the gross margin pressure that Chairman John Sculley has said will probably result in a year-to-year earnings decline in the current quarter.

First-fiscal-quarter earnings were $58.5 million, up from $56.9 million a year earlier. Per-share earnings remained flat at 91 cents.

**Tandy.** Buoyed by strong acceptance of its new line of low-cost IBM Personal Computer-compatible microcomputers, Tandy posted a 19% second-quarter revenue gain to $1.19 billion. Net income for the period also rose 19% to $103.8 million, or $1.16 a share.

"We sold more computers in the fourth calendar quarter of 1986 than in the prior three quarters combined," a spokesman for the Fort Worth, Texas, firm noted. He cited exceptionally strong demand for the new computers introduced last July, the Tandy 1000 Models SX and EX.

Earnings for the quarter were lowered by $1.8 million because of the recapture of investment tax credits.

**NCR.** Tax reform negatively affected NCR's fourth-quarter results. Earnings edged up 1% for the period to $134 million, or $1.39 a share. Revenue rose 12% to $1.5 billion.

The effect of the repeal of the investment tax credit lowered fourth-quarter earnings, the firm said. Tax reform also increased NCR's tax rate by 1.7% to 45.7%.

For the full year, however, NCR achieved record results. Earnings reached $336.5 million, or $3.42 per share, up 7% from 1985, on a revenue increase of 13% to $4.8 billion.

NCR Chairman Charles Exley said the firm finished its fiscal year "in the strongest financial position in the company's modern history." But, he added, "The slump in the U.S. computer market, with its associated pressure on profit margins, remains a major concern. We see no signs as yet of material improvement in domestic business conditions in our industry. However, order strength and profit improvement in our international operations is very encouraging."

**Tandem.** New products brought out during the past year enabled the Cupertino, Calif., maker of fault-tolerant transaction processors to report a profit increase of 133% to $27 million, or 58 cents a share, for its first quarter.

Revenue was up 40% from the comparable period last year to $238 million.

Tandem Chief Executive Officer James G. Treybig attributed the strong performance to continued international growth and improved domestic order rates. "For example, Texaco Oil AB Sweden chose Tandem systems to implement a point-of-sale application for Sweden, Norway and Denmark," he noted.

"They're growing like gangbusters," said Louis Gilio, a market researcher for Bear, Stearns & Co. in New York.

**Stratus.** The Marlboro, Mass.-based fault-tolerant vendor capped another impressive growth year with a fourth-quarter profit rise of 52% on a 40% sales increase. Stratus earned $3.7 million, or 19 cents per share, on revenue of $35.3 million.

For the year, sales reached $124.5 million, up 55% from $80.1 million in 1985. Profits grew 57% to $13.5 million, or 70 cents per share.

Stratus was particularly successful overseas selling transaction processors to the newly deregulated brokerage industry in the UK. President William E. Foster also cited several new U.S. accounts in 1986, including American Express Co., the Citibank N.A. unit of Citicorp, the American and New York stock exchanges and Mack Trucks, Inc.

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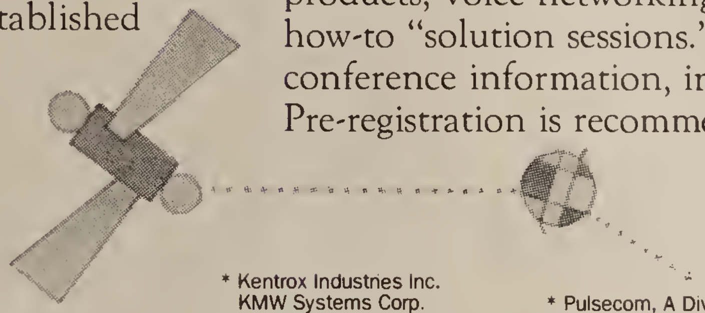

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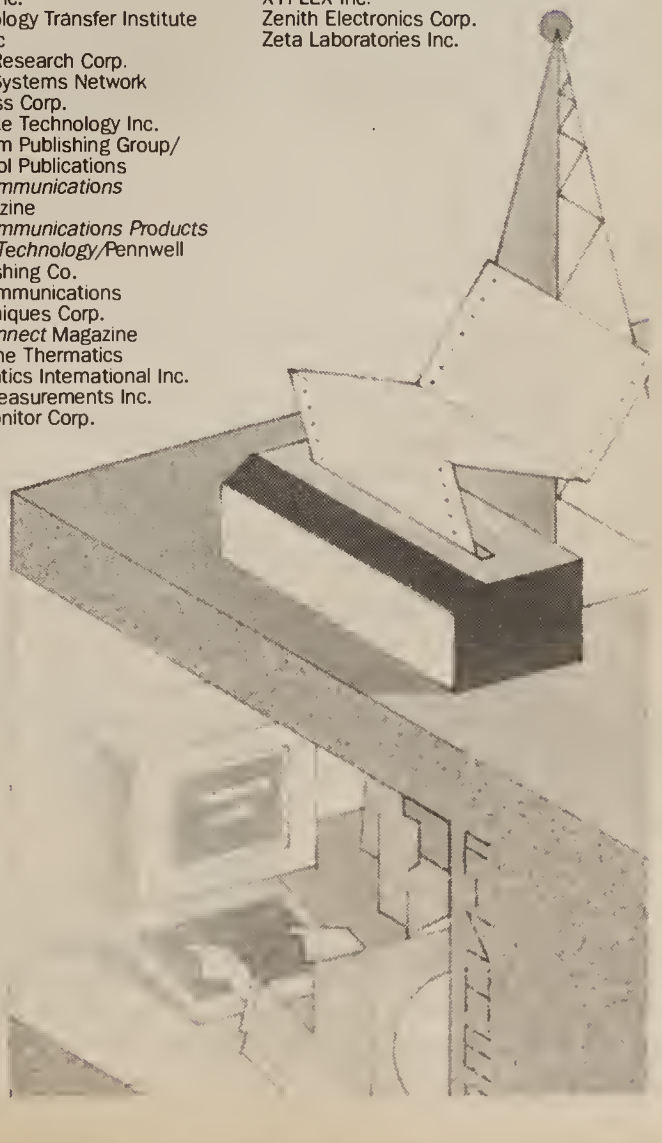

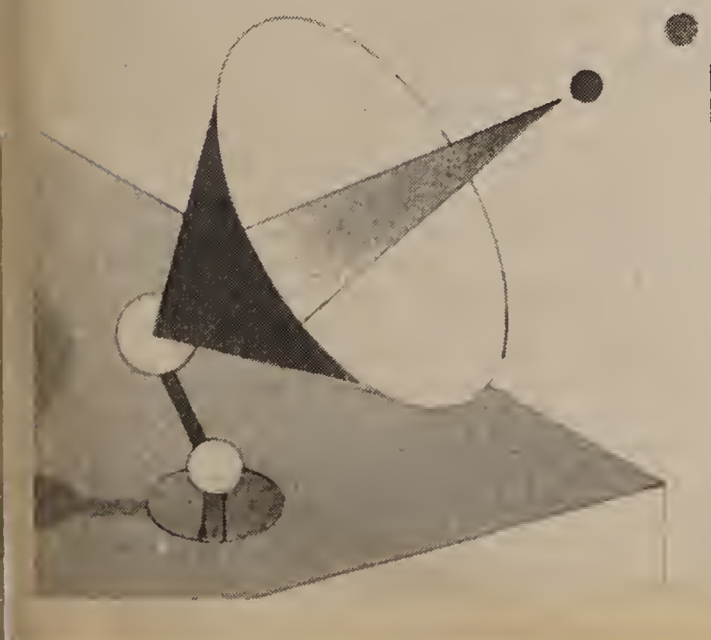

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# Sytek broadens spectrum, will support Ethernet, TCP/IP

**By Peggy Watt**

MOUNTAIN VIEW, Calif. — Broadband local-area network developer Sytek, Inc. will broaden its scope to support Ethernet, Transmission Control Protocol/Internet Protocol (TCP/IP) and new transmission media in an effort to shake the stigma of being two years in IBM's shadow.

Sytek will boost their development of twisted-pair and baseband media, said Roger Ferguson, executive vice-president of Sytek. The company already offers fiber-optic connections in a joint marketing effort with fiber-optic developer Codenoll Technology Corp. in Yonkers, N.Y.

Sytek's broader market will pit it against two other Mountain View-based network companies, Ungermann-Bass, Inc. and Bridge Communications, Inc. Ferguson said Sytek is better suited to face the competition after two years of experience as the developer and supplier of IBM's PC Network, which was all but abandoned with IBM's announcement of its Token-Ring network a year ago.

Network industry analyst Harvey Freeman, vice-president of Architecture Technologies Corp. in Minneapolis, said he is optimistic about Sytek's survival and prosperity in its post-IBM era.

"They're going to become a formidable force," he said. While Sytek has to lose its image as IBM's shadow, Freeman said the company is also well positioned because of that exposure. The income from IBM, while temporary, yielded valuable research dollars for Sytek's later products, he said.

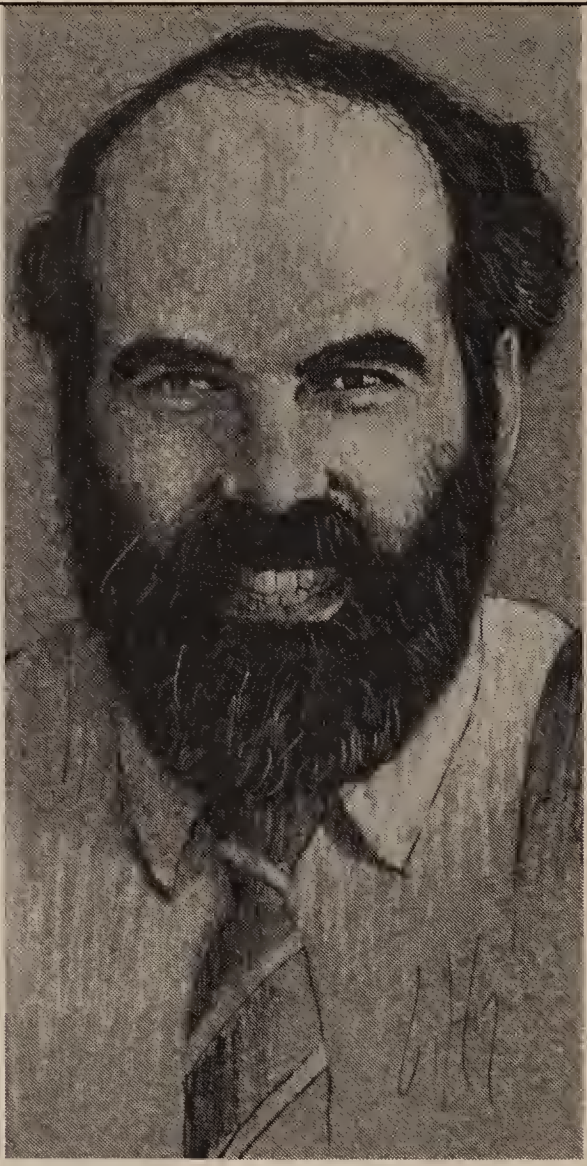
"The IBM deal," Ferguson agreed, "was both a blessing and a curse. We learned how to really define and test a product and develop a quality, defect-free product. We've translated that philosophy to our existing products."

Slightly more than half of Sytek's revenue came from IBM, and that income dropped when the contract did. The resulting losses delayed Sytek's plan for a public stock offering in 1987 at least a year, Ferguson added. IBM still owns 15% of Sytek through convertible bonds.

Ferguson said Sytek will offer "clear migration from existing Sytek systems to TCP/IP and other emerging standard protocols." TCP/IP tops Sytek's list because of the great interest in that standard by the military and government, markets that constitute more than half of Sytek's current business.

Sytek is also eyeing General Motors Corp. Manufacturing Automation Protocol/Technical Office Protocol (MAP/TOP) standards. "We are committing to supporting MAP/TOP in the future," Ferguson said. No MAP products will come out of Sytek until MAP 3.0 is released, he added.

"Within 10 days we had the names of the best distributors in three foreign countries."



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In fact, selected international market information is so scarce, Land is currently writing a guide entitled the *High-Tech Exporter's Sourcebook.* And he plans to continue relying on CW International Marketing Services for distributor contacts. He explains, *"The real added value of CW is its people and expertise in-place around the world."* He adds, *"Because CW Communications is a network of international offices, CW International Marketing Services has worldwide contacts and marketing information unavailable elsewhere."*

To find out how CW International Marketing Services can work for you, call Frank Cutitta, Managing Director, at 800-343-6474 (in MA, 617-879-0700).

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# DEC takes slice of Big Blue pie

From page 94

changed appreciably.

IBM's market share losses in the high-end of the intermediate systems market were especially noticeable. DEC's share of the $4.3 billion intermediate systems' annual shipment value at list for systems of $100,000 and up was 49%, nearly three times higher than IBM's 17.5%.

In terms of the "if sold" value of the U.S. installed base at list for such high-end systems, DEC's share of the U.S. market went from 28% to 32% in just six months. IBM's market share, meanwhile, dropped from 35% to 32% in the same time frame.

For the whole U.S. mid-range market, estimated at $5.6 billion, DEC outdistanced IBM by a 1.4-to-1 margin, despite some 12,000 low-priced System/36s that IBM shipped during the same period.

### Cash vs. unit shipments

The System/36s were the reason IBM appeared to be doing well in annual unit shipments, with a 61% market share, compared with DEC's 17%. Unfortunately for IBM, bankers and investors look for cash, not unit shipments, before passing judgment on how a company is doing.

Within IBM's intermediate systems, the System/36 is IBM's largest revenue contributor with $872 million of "if sold" value in the U.S. The 4381 shipments have dropped significantly in the first half of 1986 to $510 million, down 40% from their 1985 level of $853 million.

Such a decrease could lead to the conclusion that at times of weak demand, a high level of competition and disparate IBM product lines, the marketplace is no longer so elastic as to react favorably to IBM's aggressive price/performance actions, such as the 4381 announcement IBM made last February.

Of course, one could reasonably argue that such a conclusion may be premature — that there had not been enough time for the marketplace to fully react to IBM's price/performance move. But the figures indicate that one can at least make a strong suggestion that the intermediate systems market was not as price-elastic as IBM had hoped in the first half of 1986.

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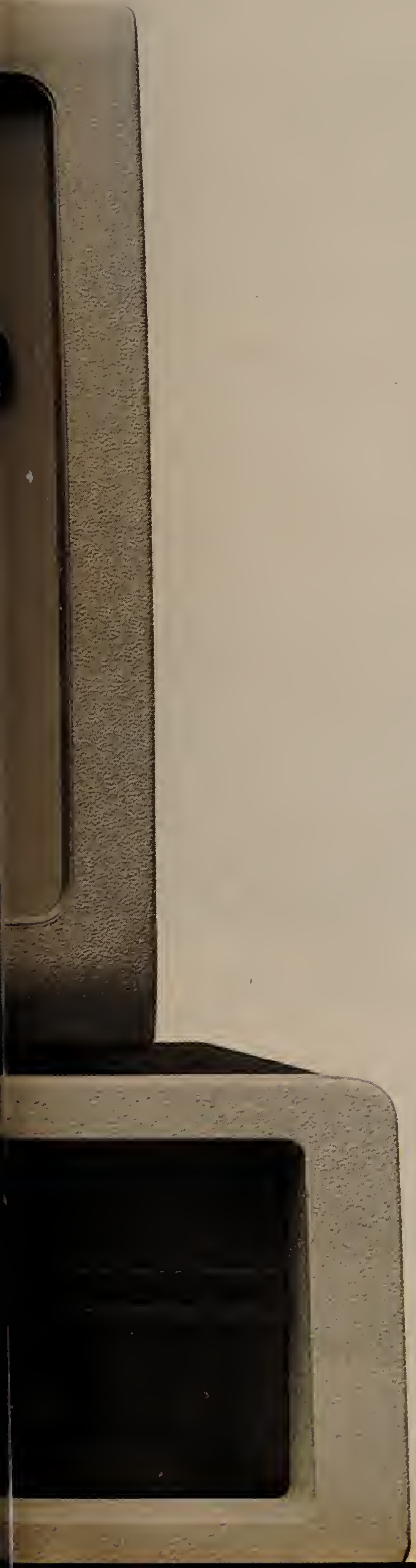

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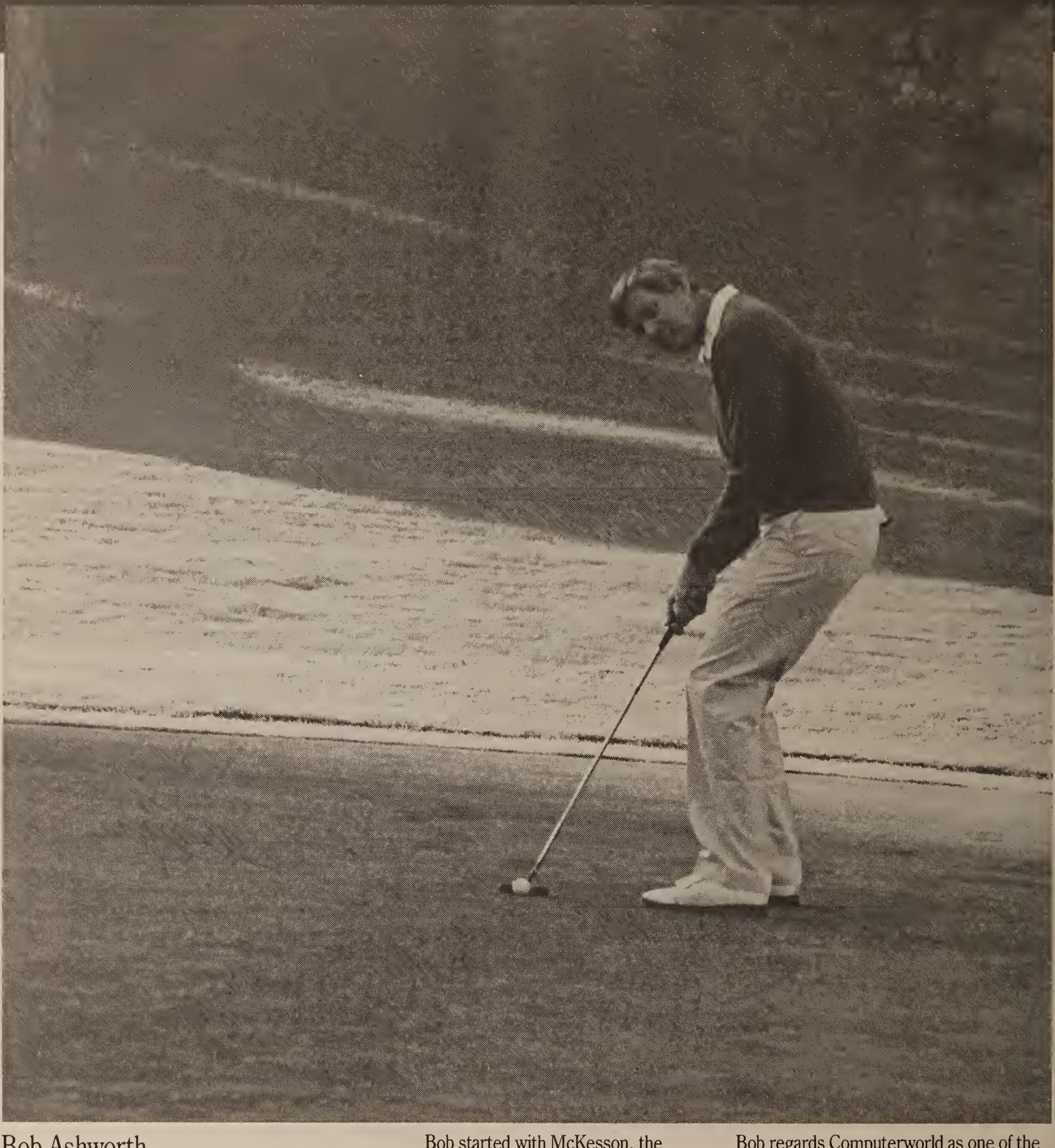

Bob Ashworth
VP General Manager
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McKesson Corporation
Age: 44
Budget: $65 million
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In his spare time, Bob's an avid golfer, a snow skier, water skier and a jogger.

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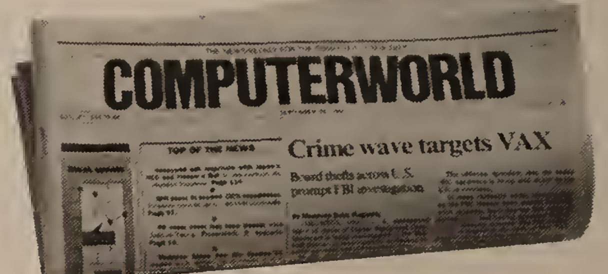

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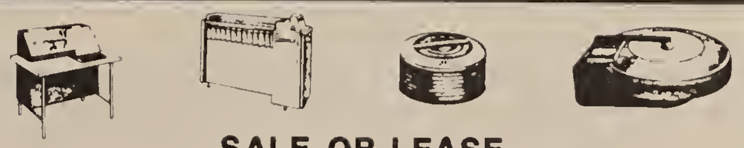

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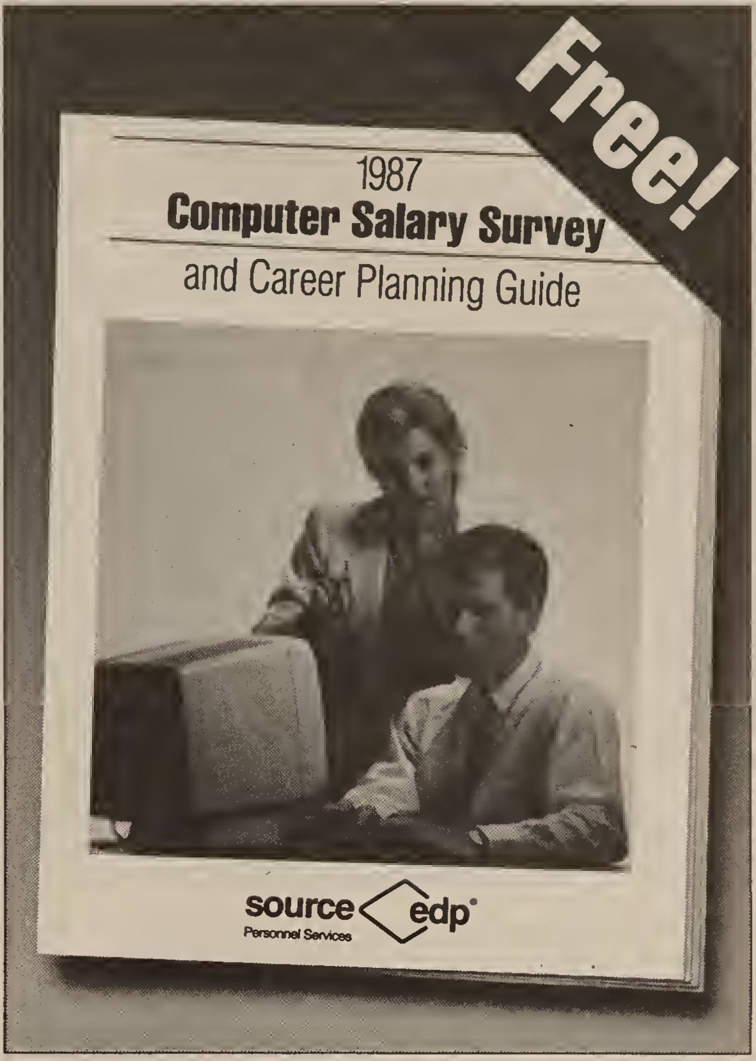

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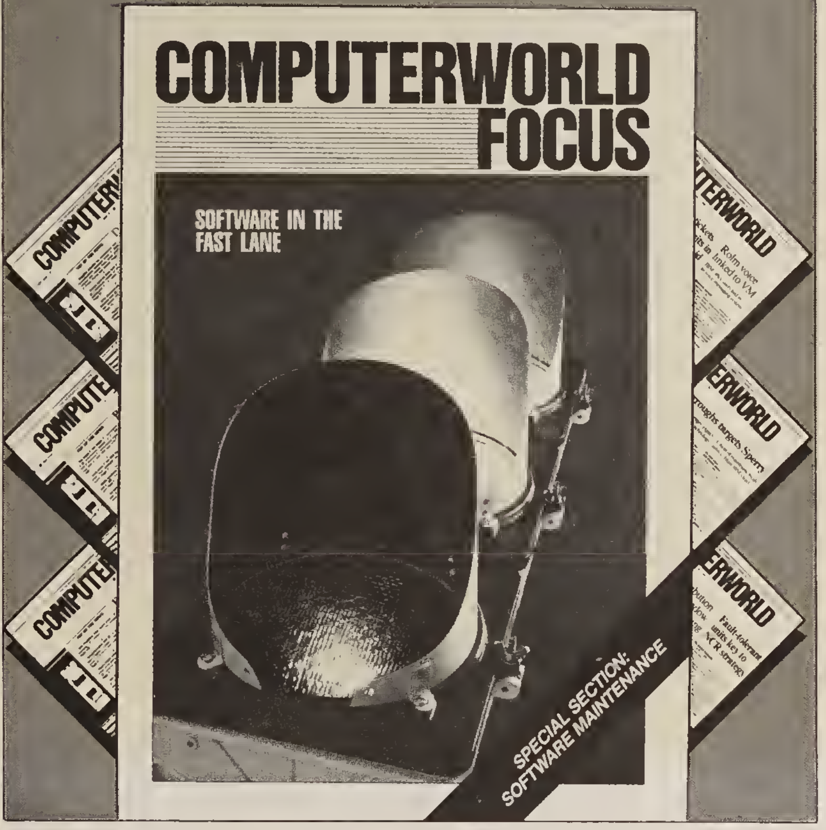
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If you are serious about a career move, it would be in **your** best interest to **exclusively** contact an agency that is well established, member of a national network, and will give your career interests top priority. No obligations! ***Please write or call Robert Montgomery collect at 919-787-4205.***

***The Data Group***
**P.O. Box 52055**
**Raleigh, NC 27612**

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## Programmer Analyst

to analyze business procedures and problems to refine data and convert to programmable form for electronic data processing. Must ensure system security. Plans and prepares special studies and investigations pertaining to development of new information systems and relational Main Frame and PC data bases. Must be able to use DBASE III, RBASE 5000, Q & A, APL, SAS, Tellagraf as well as analyze other computer language. Will troubleshoot. Responsible for design and implementation of data-based systems. Will train users of systems and applications and give technical assistance. Will evaluate use of new software products and advise clients. Involved with BETA Testing of new products. Plans and prepares reports, memoranda and instructional manuals. Bachelor or Post Bachelor Degree in Computer Science with one year experience required. Salary $32,000 per year. 40 hour week. Hours 8am-4pm. Send resumes to 7310 Woodward Avenue, Room 415, Detroit, Michigan 48202. Reference # 78386. Employer paid ad.

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## HOGAN PROGRAMMER ANALYST

One of the leading Savings & Loan Associations in the Southeast, located on Florida's West Coast, has an opportunity for an individual with 1-3 years HOGAN deposits or loans programming experience. Send resume with salary requirements to:

**FLORIDA FEDERAL SAVINGS & LOAN ASSOCIATION**
**P.O. Box 1509**
**St. Petersburg, FL 33731**
**Attn: Sandra Griffin**

Equal Opportunity Employer M/F

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## Systems Software Engineer

The Miami Valley Regional Transit Authority (RTA) of Dayton, Ohio has an immediate opening for a Systems Software Engineer.

Successful individual will have responsibility of providing technical support within the MIS department. Candidates must have at least two to five years Cobol programming experience with Digital equipment, technical applications in a VAX/VMS computer environment. Applicable experience should include in-depth knowledge of VMS operating system, layered products set, and an understanding of VAX cluster configuration and control.

In addition to a challenging career opportunity, the RTA offers a competitive salary and an excellent benefits package. Interested candidates should submit a resume and salary history no later than February 9, 1987 to

**Personnel Administrator**
**Miami Valley**
**Regional Transit Authority**
**600 Longworth Street**
**Dayton, Ohio 45401**

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## CONSULTANTS/CONTRACTORS/PERMANENT

IG Systems Inc. and its Texas affiliate, CW Systems Inc., have immediate openings if you have experience in the following areas:

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IMS
DB2/SQL
CICS

C-Language
CDC Cyber 180
SNA
UNIX
DEC VAX 11/75

or application experience in:

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Point of Sale
Life-Comm/Life 70

Please call or write:

CW Systems Inc
300 West 5th Street
Suite 936
Austin, Texas 78701
512-469-0245

IG Systems Inc
3345 Wilshire Blvd.
Suite 501
Los Angeles, CA 90010
213-386-0400

IG Systems Inc
1301 Shoreway Road
Suite 200
Belmont, CA 94002
415-591-5736

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**303 Congress St., Suite 600**
**Boston, MA 02210**
**(617) 848-7874**

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## CICS, IMS, IDMS SunBelt/National Opportunities

Let us assist you in finding that career advancement opportunity by sending your resume. All fees company paid with salaries in the $25-60,000 range. If you're an experienced EDP professional, contact us today.

**Western Technical Careers, Inc.**
**3030 S. Rural Rd. Dept CW**
**Tempe AZ 85282**
**(602) 894-1166**

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## BANKING PROGRAMMERS

Tennessee bank has various COBOL positions: CPCS, loans, stock trusts, investments. Also Assembler positions: credit card, CIS. 3 years + experience. Salary to low $30's.

Contact Mike Denison:

2720 Stemmons Frwy., 1207C
Dallas, TX 75207, (214) 637-6360

DATA PROCESSING CAREERS INC

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## PROGRAMMER-RPGII, COBOL

Rural setting, all sorts of outdoor recreation awaits you at this shop. What they need is a Prog, to design and code RPGII and COBOL Systems applications on an IBM 43XX host. Must be able to work independently. Any exposure to CPG a plus. Salary to $25,000.

**ROBERT HALF**
**DATA PROCESSING**
**7733 Forsyth Blvd.**
**St. Louis, MO 63105**
**(314) 727-1535**

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## OREGON OPPORTUNITY

Rogue Valley Medical Center, a regional medical center serving southern Oregon and northern California, seeks RPG III Programmer/Analyst with minimum two years experience for growing data processing department. Position requires knowledge of the IBM S/38 and its operating system. Some supervisory experience and BS in Computer Science preferred.

Contact **Personnel**
**Rogue Valley Medical Center**
**2825 Barnett Road**
**Medford, Oregon 97504**
**(503) 770-4243** EOE

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## Information System Programmer

Develop & write natural & artificial lang. computer programs to locate & retrieve utility customer & billing data & info. Write programs for classification, indexing, input, storage & retrieval, display devices & interfacing w/other systems equip. Devise sample input. Correct program errors. Confer w/info. scientist. Requires B.S. in Computer Science/information systems and 6 mo. Experience. Use of PASCAL, C, or FORTH; multi-tasking operating systems in systems programming; and MS/-DOS for IBM-PC. Sal: $22,000 yr. Job site & interviews, Spokane, Wa. Send resumes to: Empl. Sec. Dept. ES Div. Attn: AEC#45759, Olympia, Wa. 98504 not later than Feb. 23, 1987.

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**Programmer** to program EDP task related systems. Requires Bachelors or equivalent (nine months professional experience is equivalent to one year of undergraduate education) in Data Processing or Computer Science. Requires two years experience including PL/1 or COBOL, ADABAS, NATURAL, and JCL. Salary is $26,400 per annum. Job El Segundo, California.

Resume to CW-B4875,
Computerworld, Box 9171,
Framingham, MA 01701-9171

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PROGRAMMER/ANALYST -- Resp for setting up computer hardware, selecting & eval software & developing programs for Claims Dept using DBASE III. Resp for modifying & maintaining existing programs util COBOL, C, JCL, PASCAL, DOS, OS/MVS & VM/CMS on IBM PC. $29,500/yr, 40 hrs/5 days/wk. Req'd: Master's - Comp Sci., 3 mos exp or 3 mos rel exp - programming. Send resume to: NYS Job Service, order #NY8021534, 97 - 45 Queens Blvd, Rego Park, NY 11374; DOT code 012.167.066.

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ACP/PARS Programmer for airline control program (ACP) operating system, using IBM hardware. Uses knowledge of system capabilities & symbolic logic to develop program steps. Performs testing to solve problems. Writes new software for passenger airline reservations system (PARS). Prepares written instructions to guide users, including reports of all program modifications. Places system on line after completion of testing. Uses recoup technique to manage pools of data records. Performs duties using IBM Assembler & PL-1 languages. Must have minimum B.Sc. in Computer Science or Engineering or three years ACP/PARS exp. Hours Mon-Fri 730am-4pm. Salary $2,100/month to $3,900/month according to applicant's skills. Send resume only to Job Service Of Florida, 1350 N.W. 12th Ave., Rm. 280, Miami, FL 33242. Ref: Job Order # FL4549578.

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# PROGRAMMER/ANALYST

Under general direction, provides support to MIS staff in the areas of systems software support, problem resolution, new version test and migration, quality assurance, systems configuration, etc. Involves extensive interaction with systems programming, operations, end user, application development, and vendor staff. Provide, as a member of the Technical Support team, operational support for a number of IDMS/DC on-line systems which may occasionally necessitate working outside the 9 to 5 timeframe.

Performs self-assigned tasks including but not limited to, development of overall systems design specifications, design and code key modules and sub-systems, monitor system performance, develop quality assurance procedures and testing facilities, evaluate and recommend software tools, work with project leaders and other technical staff to assure cross system capability.

Requires thorough knowledge of the following: OS/JCL, OS/MVS, CMS. Knowledge of the following preferred: Cullinet Tools, PL/I, VSAM. Knowledge of the following helpful: Assembler, IMS/VS DB, CICS, MARKIV.

Send resume to:

**JOAN DOIG**
**PERSONNEL SERVICES**
**CLIO HALL**

**Princeton University**
**PRINCETON, NEW JERSEY 08544**

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# DO YOU HAVE WHAT IT TAKES?

**COMPUTER SOFTWARE EXPERTS:**

If you are a superior performer looking for a creative working environment with more challenge and less bureaucracy, then 4GT wants to meet you!

Fourth Generation Technology, Inc. develops state-of-the-art large 4GL business computer systems. We have a continuing rapid expansion and are looking for proven performers to design and program major systems. We provide superb working conditions including developmental mainframes and a powerful proprietary 5GL system development CASE tool.

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- 5 years hands-on experience specifying large systems
- 10% travel likely

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- 5 years hands-on experience developing large systems
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PROGRAMMER ANALYSTS

- Requires 2 years successful experience in developing large computer systems.

Send your resume, including salary requirements to: Ms. Susan Randle, Fourth Generation Technology, Inc., 10280 North Torrey Pines Road, Suite 350, La Jolla, CA 92037, Department 311. *Equal Opportunity Employer*

**4GT**
FOURTH GENERATION TECHNOLOGY, INC

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Applications are invited for a faculty position at the **Instructor/Assistant Professor level** beginning Fall, 1987, Department of Computer Science **Plymouth State College**. Teaching responsibilities include upper level and introductory courses for CIS majors, and a general education course for non-majors. The department has six full-time faculty supplemented by lecturers and offers bachelors' degrees in Applied Computer Science and in Computer Information Systems. Instructional computing facilities include a programming laboratory, a microcomputer laboratory with a local area network and a UNIX operating environment supported by Pyramid 98X and PDP 11/70 supermini computers.

The Plymouth Area is located at the base of New Hampshire's White Mountains, minutes from the Lakes Region, and is a major recreational center for the Northeast. Plymouth State College enrolls 3500 undergraduates in a wide variety of programs and is a major cultural focus for central New Hampshire.

*Minimum Qualifications:* a graduate degree with a CIS concentration; plus enrollment in doctoral program, doctorate preferred, experience in CIS analysis, design and implementation; experience, aptitude and interest in undergraduate teaching. Send resume, transcripts and three letters of recommendation to: **Search Committee, Department of Computer Science, Box X, Plymouth State College, Plymouth, New Hampshire 03264, (603) 536-1550**, ext. 530. Applications will be accepted until March 1, 1987. Plymouth State College is an AA/EOE.

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# DATABASE ADMINISTRATOR

McM CORPORATION is seeking a qualified IDMS/R Database Administrator to implement our state-of-the-art data processing software.

This position requires a highly motivated individual with 2-4 years experience and an extensive background in the use of IDMS/R, IDD, ADS/O and Database Design are required.

McM CORPORATION offers competitive salaries and benefits, and an opportunity to grow in a dynamic environment. For immediate consideration, please send resume and salary history to:

**Employment Representative**
**McM CORPORATION**
**P.O. Box 10234**
**Raleigh, NC 27605**

***NO AGENCIES OR PHONE CALLS***

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# SYSTEMS DESIGNERS, PROGRAMMERS, PROJECT MANAGERS

**J.J. Kenny Co., Inc., a highly regarded WALL STREET firm, and a leader in the municipal bond brokerage business, has significant career opportunities to support growth and a tradition of maintaining state-of-the-art computer systems and software.**

**WE OFFER:** A positive, motivating work environment, plus the challenge of participating in the redesign of our entire application portfolio. Added to this, we offer excellent compensation and benefits.

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- **Project Managers: 5+ years**
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Bachelors degree required - MBA preferred. Excellent verbal/written skills necessary. If qualified, send resumé and current salary in confidence to:

**Human Resources - DP**
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55 Broad Street - 1st floor, New York, NY 10004

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# ABU DHABI NATIONAL OIL COMPANY

Abu Dhabi National Oil Company (ADNOC) controls and co-ordinates the operations of both onshore and offshore oil and gas exploration and production and associated petrochemical industries.
The Company wishes to recruit the following personnel in its Finance Directorate:

## SENIOR FINANCIAL ANALYST:

The candidate for this position will be required to analyse financial statements as necessary, to evaluate the impact of budgets on Group Company Balance Sheets, to follow-up and analyse financial market trends and to perform loan administration functions.
The candidate should have a first degree in Business Administration, Accounting, or equivalent coupled with at least 7 years relevant experience in financial analysis.

## SENIOR ACCOUNTANT:

Responsible for performing accounting duties relating to ADNOC's Cash Management. Co-ordinate and monitor the flow of funds through the company's bank accounts. Evaluates and analyse the company fund utilisation activities and financial institutions holding ADNOC's funds.
The candidate for this position should have a first degree in Business Administration, Accounting or equivalent plus 6 years relevant experience in cash management.
Both positions require high proficiency in English and Arabic. Experience in computerised accounting system is also essential.
We offer competitive tax-free salaries plus a full range of expatriate benefits including free accommodation, subsidised school fees, airfares and generous paid annual leave.
Interested candidates are invited to forward their detailed applications together with photocopies of their education and experience certificates, within three weeks from the date hereof, to:

THE HUMAN RESOURCES DIVISION MANAGER
PERSONNEL DIRECTORATE
ABU DHABI NATIONAL OIL COMPANY (ADNOC)
P.O. BOX 898 — ABU DHABI — U.A.E.

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As a key member of our MIS Department, you will be responsible for:

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Background should include a Bachelor's Degree with 6-8 years experience in data processing and/or office systems and 3-5 years supervisory experience. At least 2 years experience working in a VAX and microcomputer environment and good interpersonal and communication skills are required. DEC ALL-IN-1 experience highly desirable.

Your abilities and potential will be recognized with a competitive starting salary and benefits package. Our location offers a mild climate year round, access to some of the finest universities in the country, numerous cultural activities and nearby recreational facilities. For prompt consideration, please forward your resume, including salary history, to:

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# NEW ENGLAND

### BOSTON
**SYSTEM-38 SPECIALIST**

Nat'ly recog. mfr. seeks sr. tech. pro for leadership role in major HW/SW install. plus diverse new sys. devel. projs. Min. 3+ yrs. w/solid RPG-III, CL & fin'l, mktg. or mfg. apps. knowl. Exciting ground floor oppty. NE cand. pref. Salary to $40K.

### BOSTON
**SENIOR P/A - CICS**

One of SUBURBAN BOSTON's leading firms seeks six add'l. Sr. P/A's to augment devel. teams. Environ. is multi IBM 3090 MVS CICS COBOL DBMS. Oppty. to use your CICS as catalyst to join fast-growing firm. Salary to $37,000.

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Exciting s/w devel. firm seeks astute analyst for integrated invty., fin'l. & mgmt. report apps. Req. VAX/VMS, COBOL, BASIC & excellent commun. skills. Outstanding firm w/history of solid growth & promotion from within. Salary to $32,000.

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Data base pros seeking growth positions in data base design, data modeling, data architecture & DB sys programming. Investigate multi oppty's. in HARTFORD area w/IBM/OS/MVS/XA install's. Salary to $34-$35,000.

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Major fin'l. org. seeks qualified prog/analysts to work on a number of on-line devel. projs. in a CICS/IMS environ. Min. 2+ yrs. IBM exp. Co. provides excellent benefits & full reloc. Salary to $36,000.

### PROVIDENCE
**PROJECT MANAGER/ SOFTWARE DEVELOPMENT**

Industry leader seeks mgr. for new sys. devel. Prior tech. exp. in lge. IBM on-line environ. Additional exposure to structured programming & strong managerial bkgrd. are +'s. Enjoy coastal R.I. lifestyle w/excellent quality of life. $45,000.

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# DALLAS

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Seeking the above data processing professionals with 1+ years experience in PL/1 or IMSDBDC in an IBM mainframe environment. Projects involve applications designed, development and enhancements. Competitive salary and excellent benefits. All fees, interviewing and relocation expenses paid by the employer. Positions available in the lower Midwest and the South. If interested in furthering your career goals in a growing state-of-the-art environment, please forward resume in strict confidence or call COLLECT:

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Programmer/Systems Analyst - MBA with MIS specialty: Plan, schedule and direct preparation of programs to process business data and solve business oriented problems using computers. Design, develop and implement micro/mainframe-computer based business application systems in consultation with management personnel. Install the systems and train users. Will work with IBM/VAX mainframes and micros. Knowledge of COBOL, FORTRAN, IFPS, LOTUS, DBASE, FOCUS, SPSS and SAS. 5 day/40 hr. wk. Salary $30k-35k/yr. Mail resume to NYS Job Service, 68 W. Huron St., Buffalo, NY 14202. Job Order 0100082-DOT 012.166.066.

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## COMPUTER/INFORMATION SCIENCE

Tenure track, September 1987. Ph.D. preferred or Master's, teaching experience, and/or practical experience. Ability to instruct in the following: Introduction to Data Processing, MIS, Database, Systems Analysis and Design, and Microcomputer Applications. Salary to low $40's. (A second physics/computer science position also available). Send detailed resume, transcripts, and 3 letters of recommendation to:

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**Vice President for Academic Affairs**
**Carroll College**
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Review of applications will begin on March 2, 1987. Carroll College is an Equal Opportunity/Affirmative Action Employer.

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## SACRAMENTO
## & San Francisco Bay Area

**Systems Programmers**
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Vertical market software company seeks highly motivated, exp. marketing rep. This individual must have a solid accounting background and 2+ yrs exp. selling data processing systems solutions. Must be professional; BA, BS degree required. Salary and commission. Good benefits. Reply to: Director of Marketing

**Abacus Software, Inc.,**
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St Petersburg, FL 33734

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*Positions:* **Quality Assurance Analyst For Real-Time Systems**
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- ● Self-starter capable of working in a totally unstructured environment under very little supervision
- ● Team worker who knows how to laugh at himself
- ● Problem definer as opposed to (dart thrower)
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*Compensation:* Salary plus bonus (we pay in direct proportion for what we get), plus pension, health care/life insurance, education and other benefits.

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# VIRGINIA

## Computer Operations Manager

Large computer service bureau operations (located 55 miles south of Washington, D.C.) in the direct mail marketing industry is seeking the right individual as an Operation Manager in a highly active environment. Successful candidates must be hands-on results oriented with strong people management skills. Encumbent responsible for 24 hours, 7 day week operations. Current configuration includes 24 impact printers. Qualified candidates must have 3+ years as Operations Manager with MVS/XA and JES experience. Bachelor's degree or equivalent plus demonstrated supervisory experience. Send resume to:

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SYSTEMS ANALYST, Senior

Design & supervise coding of software/firmware for proprietary database computer; port existing dbase mgmt. sys. coded in C, to UNIX based multi-processor. Req. Masters in Computer Science & 1 yr. exp. as Sr. Sys. An. or Masters & 2 yrs. exp. as Sys. An. Salary 36k/yr. Job site/Interview: Chatsworth. Send this ad and a resume or letter stating your qualifications to Job # DN 11223, P.O. Box 9560, Sacramento, CA 95823-0560 not later than Feb. 10, 1987.

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Attn: Don McLaurin
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Senior Programmer for programming and systems analysis in data base area of airline control program (ACP) operating system. Performs coding, testing and modifications using specialized development tools. Writes new software for passenger airline reservations system (PARS). Develops software and testing tools to provide direct access to users. Performs duties using SABRE-TALK & BAL. Must have minimum two years experience same job; ability to work in both online & offline environments; technical writing ability; knowledge of software development tools; if no prior ACP/PARS experience, must have two years BAL experience; skill in data base and systems interface. Hours Monday-Friday. 7:30am-4pm. Salary $2,147/month. Send resume only to Job Service Of Florida, 1350 N.W. 12th Avenue, Room 280, Miami, Florida 33242. Ref: Job Order # FL4539579.

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## Northeast Magic

Major NE Bank requires **financial systems design** indiv.; IBM 3090, MVS, COBOL, CICS, IMS, IDMS, ADSO. Ldrshp. creativity, user comm. skills. To 40K

**Systems Analyst** - Major mfg. co. state of the art computer-based systems, needs indiv. with analytic & comm. skills. IBM, DOS/VSE, COBOL. To 40K

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Phone: (203) 278-7700

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## MANAGEMENT INFORMATION SERVICES DIRECTOR
### City of Greeley

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**Process Control Technical Specialist** for industrial process engineering firm located in Cincinnati, Ohio. Utilizing understanding of unit operations, chemical process & instrumentation fields, knowledge of micro processor-based control systems, & concept of system approach to process control, develop piping & instrumentation diagram, process control strategies & logic, systems concept & data; write system functional specifications & system hardware specifications; develop implementation of system, programming & dynamic models & simulation; maintain system documentation. Requires Associate in Science Degree in Chemical, Electrical or Control System Engineering & 5 yrs of experience in the job described. 40 hrs/wk +/- 10% overtime. $17/hr. Qualified applicants only send resume with this ad to R. Lechler, JO # 0685945, Ohio Bureau Of Employment Services, PO Box 1618, Columbus, Ohio 43216.

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Advanced Systems Division

# COMPUTER SYSTEM MANAGER

**At Northrop Advanced Systems Division in Palmdale, Southern California,** you can improve the quality of your career with our excellent facilities and stimulating projects. You can also improve your quality of life in this unique area an hour from the metropolitan Los Angeles area, where housing costs are attractively affordable and recreation abounds.

Manage and administer multi-functional staff responsible for maintaining large IBM mainframe CAD/CAE 2D and 3D geometry software systems and coordinating activities related to manufacturing business operations. Requires heavy user contact and exceptional communicative coordinating skills.

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**NORTHROP**

**Advanced Systems Division**

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## VAX BASED MANUFACTURING SYSTEMS

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Our United States and Canadian Applications Client Services Consulting Group now has openings for Systems Analysts, Data Base Administrators, and Programmer/Analysts that are experienced in one or more of the following areas:

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# Ansa, Lotus ink Paradox pact; TAC gains support

**By Douglas Barney**

BELMONT, Calif. — Ansa Software and Microrim, Inc. both recently announced support for Lotus Development Corp.'s The Application Connection (TAC), a software product aimed at the micro-to-mainframe market.

"We have a very extensive micro-to-mainframe strategy. The first component of that strategy is the relationship with Lotus under which Paradox and TAC will work together," said Ron Posner, president and CEO of Ansa.

Ansa also reached a joint marketing relationship with Cambridge, Mass.-based Lotus involving Paradox, Ansa's data base software. According to Posner, the joint marketing relationship involves both current and future products.

"The joint marketing relationship will go on into the future for other products that each of us will come out with that will work together," Posner said. "Our salespeople will jointly try to sell TAC with Paradox and vice versa."

### Data base access

TAC allows microcomputer users to access data on mainframe-based data base programs and fourth-generation languages, while using a personal computer-type user interface.

Ansa is looking to develop or license additional technology that will allow Paradox to communicate with a variety of systems. The local-area network version of Paradox will be unveiled in a couple of months and will ship by the end of the second quarter, Posner said.

Redmond, Wash.-based Microrim earlier this month announced a direct interface from its R:Base System V data base software to TAC. Using R:Base System V's Filegateway utility, files from supported mainframe data bases are automatically converted to a format usable by R:Base. System V now also has the ability to export files in the same file format as Ashton-Tate's Dbase III.

In addition, Ansa announced an OEM program and signed its first OEM agreement with Wang Laboratories, Inc. under which Wang will market Paradox through its 1,250 direct field sales representatives.

In other news, Ansa is seeking a way to allow Paradox to take advantage of the untapped power of Intel Corp. 80286- and 80386-based microcomputers and may not wait for Microsoft Corp. to pave the way with its next version of MS-DOS.

"As soon as we can find a way to break through the 640K-byte memory barrier on the 286 and the 386, we will immediately take advantage of the memory with the current product without it being rewritten," Posner said.

"If we can figure out a way to do that without Advanced DOS [the anticipated next version of DOS from Microsoft], we will do it and have the product in very short order. We have to find a way through the 640K-byte memory barrier," he added.

Posner, however, is uncertain whether this approach is technologically possible.

# IBM rebound hampered

From page 1

tinue. It is a fundamental change in the nature of demand, indicating IBM's problems are deeper than people are willing to recognize."

IBM's well-publicized mid-range systems shortcomings were apparently acknowledged by Chairman John F. Akers, who cited "unsatisfactory levels of demand for parts of our product line" as one reason for Big Blue's 1986 performance.

But IBM must also move quickly to stem a mass exodus of potential 3090 buyers into the used 3080 market.

A recently completed International Data Corp. survey of 500 IBM user sites indicated intentions to purchase only 202 3090 CPUs in the first half of this year, compared with roughly 1,020 such purchases in the first half of 1986.

However, the same buyers intend to purchase 786 3080 processors, up from 675 in 1986, the survey showed.

"IBM's big battle is to drag as many of those as possible back into the 3090 column," IDC analyst Frank Gens said. "They have got to improve the price/performance of the 3090 to get that revenue."

### 'VAX killer'

All indications are that the 9370, dubbed the "VAX killer" in reference to Digital Equipment Corp.'s highly successful mid-range computers, could be IBM's make-or-break product this year.

"Since sales of PCs were flat and Sierra sales were up, the problem was obviously in the mid-range," said Michael Geran of E. F. Hutton & Co.

Salomon Brothers, Inc. analyst Marc Schulman estimated that IBM has received 30,000 orders in the U.S. and 15,000 orders overseas for the 9370.

He predicted that IBM will ramp up volume 9370 production in the second quarter, producing significant revenue just as Big Blue sees the positive benefits of last year's work force reductions and plant closings.

"By mid-year, all the people coming off the payroll will be off, costs will be down and shipments will be up," Schulman said. "And as the use of IBM's connectivity software and DB2 proliferates, that will consume considerable machine cycles. I expect a recovery, but by no means a return to the glory days of 1983 and 1984."

Schulman predicted that IBM will gear up a new product cycle this year with a 15% price/performance enhancement of the 3090, a low-end "clone killer" Personal Computer, a new Intel Corp. 80286-based micro, a six-way 3090 processor and an 80386-based microcomputer.

Rooney, however, suggested that 9370 sales may cut into demand for the processing power of IBM's high-margin mainframes.

"The 9370 accelerates what DEC is doing to IBM," he said.

"You've got to sell an awful lot of $100,000 and $200,000 boxes to make up for the lost multimillion dollar mainframes. The company is not positioned, from a cost standpoint, to sell a lot of smaller systems," he added.

### Consolidation efforts

IBM took several steps to reduce its work force and consolidate operations during the year, resulting in a fourth-quarter charge of an estimated $425 million.

Fourth-quarter profits of $1.39 billion resulted in a full year decline in profits of 27%, from $6.55 billion to $4.79 billion — their lowest level since 1982. Per-share profits fell from $10.67 in 1985 to $7.81.

Rental income dropped by 35% during the year, while revenue from services increased 24%.

IBM's pretax profit margins dropped significantly from 23.2% in 1985 to 16.4%. Net profit margins fell from 13.1% to 9.3%.

### Saved by currency

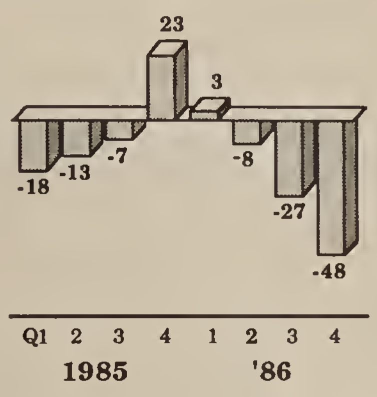
The decline in the U.S. dollar's value between 1985 and 1986 prevented IBM's disappointing year from being a major disaster.

IBM estimated that the favorable currency valuation added $4.35 billion to its revenue and $645 million to its bottom line.

A company statement said IBM's first-quarter 1987 earnings will be less than its profits in the first quarter of 1985, in which profits fell 18% from 1984 levels to less than $1 billion.

**IBM Earnings**

*Percentage gain/decline compared with year earlier*



CW CHART

# 3Com to buy Centram, developer of Tops distributed networking system

**By Douglas Barney and Patricia Keefe**

SANTA CLARA, Calif. — In a move strengthening its position in the Apple Computer, Inc. networking market, 3Com Corp. last week signed a letter of intent to acquire Centram Systems West, Inc., developer of Tops, a distributed networking software package.

The deal is expected to be finalized by the end of the month and calls for a stock exchange and a pooling of interests.

The Centram purchase is the first step under a vision that involves building a federation of software companies at 3Com to provide a host of products that plug and play, said Robert Bressler, vice-president and general manager of 3Com's Software Division.

"The next step is to look around and find software companies that will help bolster our leadership position in the local-area network market," Bressler said, adding, "Centram does that." 3Com will either purchase those companies or form strategic alliances.

Right now, 3Com will concentrate on building Tops compatibility into its Macintosh product line. "We will quickly offer the 3Server3+ as a server for the Tops line," Bressler said.

Ethermac, 3Com's low-end solution linking IBM Personal Computers to Macintoshes, "will not be the focus of any new marketing efforts," although it will continue to be supported, Bressler said. Users prefer the Tops interface to Ethermac's, he added.

"Yes, we are backing away from Ethermac and putting our focus into integrating Tops into 3Com solutions," Bressler said. Those plans are expected to dilute the efforts of Orem, Utah-based local-area network rival Novell, Inc., which is hard at work developing Macintosh compatibility with its own networking software, Advanced Netware. Novell is expected to show prototypes in the near future.

Novell and 3Com are already battling it out for market share in the IBM PC and compatible networking arena. The Centram purchase allows 3Com to fill gaps in its product line, both vendors said, and eliminates some overlap between the two product lines and dealer agreements.

For example, while 3Com provides gateways in the electronic mail area and print spooling, Tops provides Unix interconnection and Adobe Systems, Inc. Postscript conversion.

3Com will position Centram as an entry-level system providing a soon-to-be-built upgrade path to 3Com's 3+ networking software.

Users believe the 3Com acquisition might expand the product's market. With 3Com owning Tops, his company might take a closer look at Tops, said Chuck Miller, member and former president of Gateway Microcomputer Managers Association in St. Louis.

This acquisition of Centram Systems by 3Com might also serve to make Tops more attractive to Pratt & Whitney Aircraft. "It moves it from 10th priority to eighth priority," said Ron Goldfarb, manager of office automation at Pratt & Whitney's administration section in Hartford, Conn.

Tops has been installed on 15,000 workstations in its first five months on the market. It allows Macintosh computers to transparently share files with Unix-based machines and Microsoft Corp.'s MS-DOS.

The buyout is not expected to encounter the difficulties faced by 3Com in its failed attempt last spring to merge with Convergent Technologies, Inc. Bcause Centram is a private company, the buyout is subject to different rules and easier to pull off, 3Com's Bressler said.

*Senior writer David Bright contributed to this report.*

# HP founder Hewlett to retire

**By Clinton Wilder**

PALO ALTO, Calif. — Hewlett-Packard Co. Vice-Chairman William R. Hewlett, one of the modern computer industry's founding fathers, announced last week that he will retire from the HP board Feb. 24.

Hewlett, 73, founded the minicomputer and scientific instruments firm in 1939 with partner David Packard and has served on the board since HP was incorporated in 1947. Packard will remain chairman of the board.

Shozo Yokogawa, president of Yokogawa Electric Corp., will also retire from the HP board. The new directors expected to be approved at the Feb. 24 annual meeting are Hewlett's son, Walter B. Hewlett, Packard's son, David Woodley Packard, and Ford Motor Co. Chairman Donald E. Petersen.

In other major executive changes within the industry last week, Norman Block resigned as chief financial officer of Ashton-Tate, Gabriel Fusco resigned as chief executive officer of Iomega Corp. and former U.S. Rep. Ed Zschau returned to the chairmanship of Systems Industries, Inc.

# Enmasse pulls operations plug

From page 94

masse had lagged behind its product development schedule, and development costs exceeded expectations, he said.

"The original business plan called for a product to market in one year at a cost of less than $10 million," Gardner explained. "Instead, it took 2½ years and $18 million, and it was going to take another $5 million to reach profitability. The investors felt this was far in excess of their expectation."

The company's group of investors was led by venture capital firm Oak Partners in Westport, Conn. Gardner said he requested an additional $5 million at a board meeting on Jan. 17 but that the investors declined the request.

Only six employees remain at Enmasse, which once employed 72, and the firm's goal is solely to sell the remainder of the company to interested parties, according to Gardner. "We believe we will locate a purchaser of our technology very soon," he said. A likely buyer is Toltec Computers, Inc. in Scottsdale, Ariz., which may acquire Enmasse's ECS family as the basis of its Pick-based systems.

Enmasse developed, manufactured and marketed the ECS family of Unix-based multiprocessor systems, designed for general-purpose business applications. Last Tuesday, it was scheduled to introduce the ECS 2000 line of products, which could handle, in various configurations, from eight to 2,880 simultaneous users and deliver as many as 200 million instructions per second in processing power [CW, Jan. 19].

Four-month-old Toltec had planned for Enmasse computers to be its flagship hardware line, integrating the Pick operating system and Unix on Enmasse and other hardware to sell through a dealer network. As part of its OEM agreement with Enmasse, Toltec gained the right to manufacture and market Enmasse hardware should Enmasse cease operations, according to Toltec President Alfred DeiMaggi.

If Toltec completes the purchase, Enmasse research and development could continue under the Toltec name, remaining in Massachusetts, he added. DeiMaggi said Toltec had received seed capital from Enmasse's investors but that the additional financing to buy Enmasse's assets will not come from that group.

Gardner said Enmasse has not declared bankruptcy and "remains open to sell off its technology and to meet its obligations to banks and customers."

Enmasse had lined up nine resellers of its computers and installed 20 systems at an average price of $75,000 each, according to Gardner.

Gardner is the third Enmasse president in as many years, having succeeded Chester Fennell in spring 1986. Fennell had taken over from Enmasse Founder Robert Downs in fall 1985.

# Wang, Unysis post losses

From page 94

traordinary tax credit — on revenue of $336.7 million. A year earlier, Amdahl earned $13.7 million, or 29 cents per share, on sales of $257.2 million.

For the year, revenue was $966.3 million, compared with $862 million in 1985.

**DG.** Continuing its eclipse by the long shadow of Digital Equipment Corp., the Westboro, Mass., minicomputer maker reported revenue of $313.3 million. Net income of $3.3 million, or 12 cents per share, included a $3 million tax credit.

**Prime.** The Natick, Mass., vendor said fourth-quarter profits declined to $14.1 million even though revenue increased 10% over the year-earlier quarter to $230.9 million. For the year, revenue increased 12% to $860.2 million, while profits dropped 19% to $46.9 million.

**Harris.** Harris reported second-quarter profits of $20.1 million, or 49 cents per share, compared with $14.5 million, or 36 cents per share, a year ago. Revenue, however, dropped slightly to $525.2 million.

**Sun.** Chief Executive Officer Scott McNealy said a production ramp-up that exceeded expectations accounted partially for the workstation vendor's record second quarter. Revenue soared to $115.3 million from $42.2 million a year earlier, and profits jumped to $8.5 million from $1.7 million.

# Unisys shareholders' profits, expectations on the upswing

**ACTIVE ISSUES**
Kathy Porteus

Even if investors were not thrilled by the company name chosen for the Burroughs Corp.-Sperry Corp. merger, few shareholders of Unisys Corp. (UIS — 94⅞) would complain about the stock's performance in recent months. Since mid-September, when the merger was completed, Unisys shares have soared 42%. Nevertheless, some analysts still consider the stock a good value.

"If Mr. Blumenthal continues the excellent job he has done over the past six months, the stock should work its way considerably higher," says Stephen Dube of Shearson Lehman Brothers, Inc. in reference to Unisys Chairman W. Michael Blumenthal. Such kudos come Blumenthal's way because restructuring the merged company and sales of certain assets are yielding greater than expected results.

For example, by the end of 1986, Unisys had sold $1.8 billion worth of assets, including Sperry's aerospace group and portions of Memorex Corp., Burroughs' former computer-storage unit. Blumenthal had originally targeted receipt of $1.5 billion from asset sales by 1988. In addition, the firm now indicates that its annual rate of cost savings from consolidating operations totals $3 million, which is double Blumenthal's original estimate.

Asset sales, which result in lower interest charges, and vigorous cost-cutting should greatly benefit Unisys's earnings this year, according to Don Young of Sanford C. Bernstein & Co. Young was one of the few analysts on Wall Street to have favored the Burroughs-Sperry merger from the start.

"With these factors, you have more confidence in earnings estimates, particularly when demand for computer systems remains weak," Young says. He says Unisys will earn $9 per share this year.

According to Young, new product cycles, such as that of Sperry's mid-range 1100 Model 400 processor, further support the argument for Unisys. "Even if we experience a recession in commercial systems," he says, "Unisys, with so much of its business from service, defense and government, should still hold up better than most."

Although Shearson Lehman's Dube aggressively recommends NCR Corp., he still likes Unisys, which he says should continue rewarding shareholders. Dube estimates Unisys will earn at least $7 per share this year. But citing uncertain growth expectations for the computer industry this year, Dube says, "We are obviously dealing with moving targets when it comes to the earnings of Unisys and others."

Although many analysts base their recommendations of Unisys on this year's earnings, at least one — Martin Simpson of Martin Simpson & Co. — says he prefers concentrating on longer term issues, causing him to be wary of the stock.

"The big write-offs Unisys took in the fourth quarter of 1986 mean clear sailing for at least a while," Simpson says. "But the real questions facing Unisys and its shareholders concern the number of customers Unisys prevents from migrating to other equipment manufacturers and whether Unisys can meld its two disparate organizations enough so a consistent product line and marketing strategy emerges that enables the company to grow, rather than just defensively hang on to its customer base."

*Porteus is president of Strand Research Associates, a Centerville, Mass.-based company that provides customized research services for financial and high-tech firms.*

# Software earnings climb

From page 94

though, they realized software was more important than hardware," Bloom said.

Recent increases in hardware spending have also helped the software industry, according to Kenneth J. Burke, software analyst for Alex Brown & Sons, Inc. in Baltimore.

Other leading vendors reporting financial results included:

**ASK Computer Systems, Inc.** The Los Altos, Calif., manufacturing applications vendor reported second-quarter revenue of $21.2 million, a gain of 11% from $13 million for second-quarter 1986. Net income was $2 million, or 15 cents per share, compared with $1.8 million, or 14 cents per share, a year earlier.

ASK stands to gain ground this year with the expected continuing success of the minicomputer market.

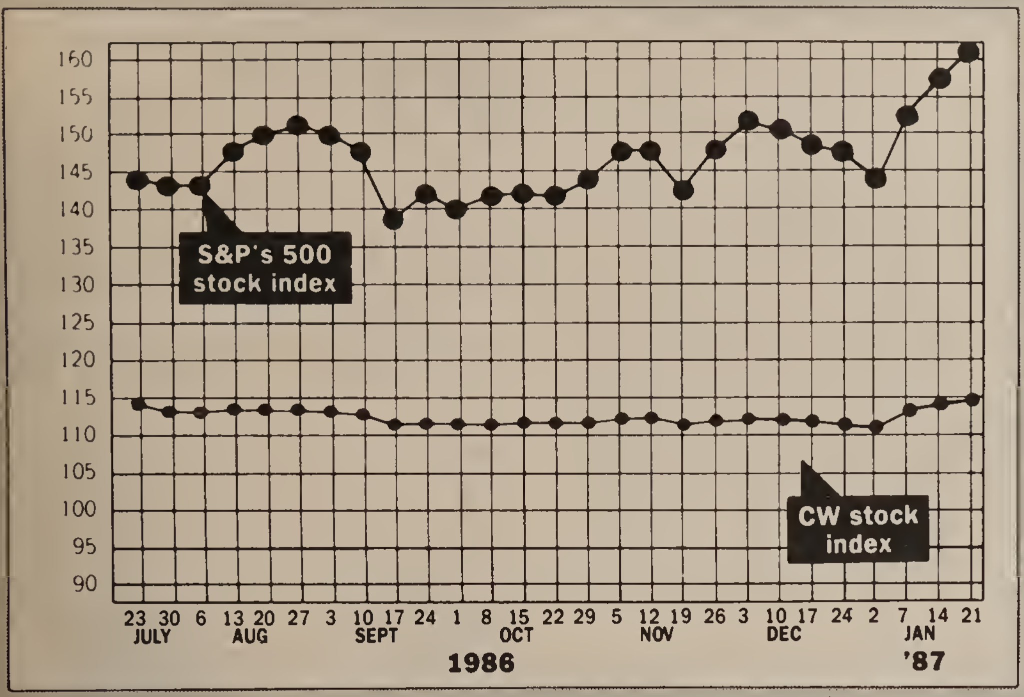
**Computer Task Group, Inc.** The Buffalo, N.Y., software consulting and programming analysis firm reported fiscal 1986 revenue of $143.4 million, up 24% from $115.8 million. Net income increased 26% to $5.1 million. Per-share earnings were flat at 68 cents, reflecting a greater number of shares outstanding.

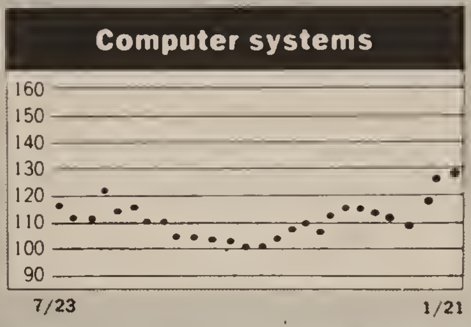
Fourth-quarter revenue was up 21% to $38.7 million. Net income was flat at $1.3 million, or 17 cents per share, because of costs associated with a recent reorganization.

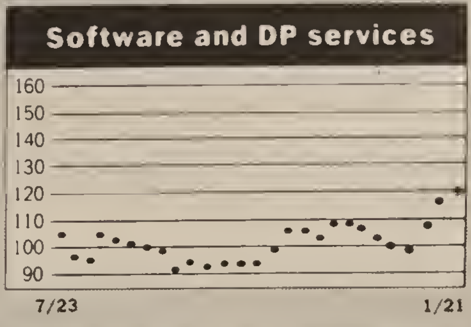
**Software Publishing Corp.** The Mountain View, Calif., microcomputer applications vendor said its first-quarter revenue for this year was $8.7 million, up 25% from $6.9 million. Net income doubled to $1.2 million, or 17 cents per share, from $617,000, or nine cents per share, in the year-earlier quarter.

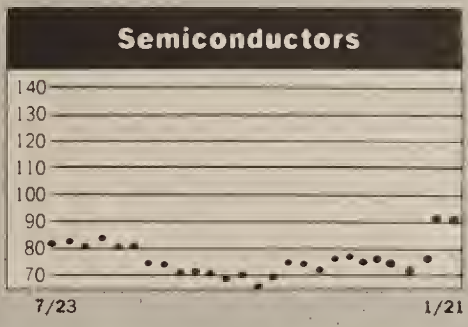
MITCHELL J. HAYES

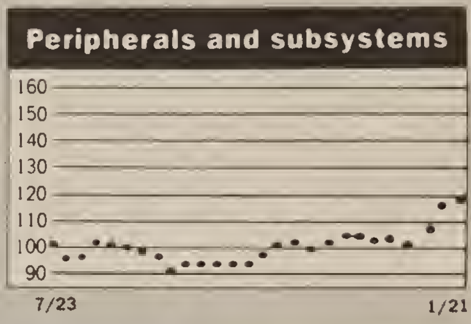
# Computerworld stock trading index





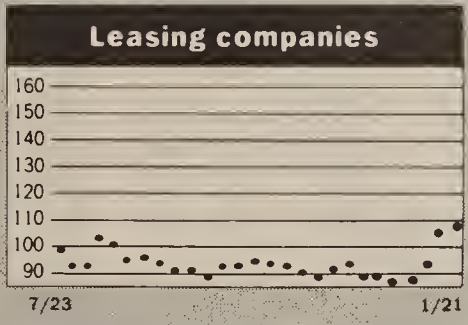


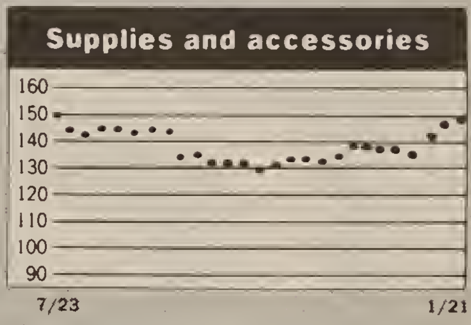




***All indexes reflect a historical base of 100 on Dec. 31, 1984, and trace stock market performance in relation to that base. The CW stock index represents the unweighted average performance of the six categories of computer industry stocks.***

| | 1/14/87 | 1/21/87 |
|---|---|---|
| Computer systems | 125.3 | **127.5** |
| Software and DP services | 114.5 | **119.2** |
| Peripherals and subsystems | 115.6 | **117.0** |
| Supplies and accessories | 146.8 | **148.5** |
| Semiconductors | 90.4 | **90.4** |
| Leasing companies | 104.5 | **107.3** |
| CW stock index | 114.5 | **114.9** |
| Standard and Poor's 500 stock index | 157.0 | **160.2** |





# Computerworld stock trading index

CLOSING PRICES WEDNESDAY, JANUARY 21, 1987

### COMPUTER SYSTEMS

| EXCH | | PRICE 52-WEEK RANGE (1) | | CLOSE JAN 21 1987 | WEEK NET CHNGE | WEEK PCT CHNGE |
|---|---|---|---|---|---|---|
| O | ALPHA MICROSYSTEMS | 8 | 4 | 4.63 | -0.1 | -2.6 |
| O | ALTOS COMPUTER SYS | 19 | 10 | 14.00 | +0.4 | +2.8 |
| A | AMDAHL CORP | 32 | 14 | 28.00 | +2.3 | +8.7 |
| O | APOLLO COMPUTER INC | 21 | 9 | 19.38 | +0.9 | +4.7 |
| O | APPLE COMPUTER INC | 56 | 22 | 49.00 | +0.9 | +1.8 |
| N | AT&T | 28 | 21 | 26.75 | +1.5 | +5.9 |
| O | C P T CORP | 7 | 3 | 4.00 | -0.3 | -5.9 |
| N | COMPAQ COMPUTER CORP | 25 | 12 | 23.50 | +0.0 | +0.0 |
| A | COMPUTER CONSOLES INC | 12 | 6 | 9.63 | +0.4 | +4.1 |
| O | CONCURRENT COMP CORP | 25 | 1 | 14.25 | -2.8 | -16.2 |
| N | CONTROL DATA CORP | 29 | 19 | 27.50 | +2.3 | +8.9 |
| O | CONVERGENT TECH | 14 | 4 | 8.38 | +0.1 | +1.5 |
| N | CRAY RESH INC | 110 | 59 | 105.88 | +9.9 | +10.3 |
| O | DAISY SYS CORP | 25 | 8 | 9.38 | -1.3 | -11.8 |
| N | DATA GEN CORP | 48 | 25 | 38.25 | +3.0 | +8.5 |
| N | DATAPOINT CORP | 9 | 5 | 5.25 | -0.5 | -8.7 |
| N | DIGITAL EQUIP CORP | 145 | 72 | 140.00 | +10.0 | +7.7 |
| N | FLOATING POINT SYS INC | 46 | 11 | 12.25 | -1.1 | -8.4 |
| N | GOULD INC | 31 | 15 | 19.38 | +0.1 | +0.6 |
| N | HARRIS CORP | 37 | 26 | 35.00 | +1.9 | +5.7 |
| N | HEWLETT PACKARD CO | 54 | 36 | 52.38 | +3.4 | +6.9 |
| N | HONEYWELL INC | 84 | 58 | 63.50 | +3.8 | +6.3 |
| N | IBM | 162 | 116 | 122.75 | +4.1 | +3.5 |
| O | IPL SYS INC | 4 | 1 | 2.00 | -0.3 | -11.1 |
| N | ITT CORP | 60 | 35 | 57.75 | +0.4 | +0.7 |
| N | M A COM INC | 19 | 12 | 13.50 | +0.1 | +0.9 |
| N | MATSUSHITA ELEC INDL LTD | 136 | 62 | 126.75 | +4.9 | +4.0 |
| O | MENTOR GRAPHICS CORP | 24 | 11 | 22.50 | +1.8 | +8.4 |
| N | NBI INC | 14 | 8 | 10.38 | +0.0 | +0.0 |
| N | NCR CORP | 58 | 40 | 56.75 | +3.4 | +6.3 |
| N | PRIME COMPUTER INC | 28 | 16 | 21.13 | +1.1 | +5.6 |
| O | STRATUS COMPUTER | 34 | 17 | 29.75 | +2.3 | +8.2 |
| O | SYMBOLICS INC | 15 | 4 | 4.25 | -0.6 | -12.8 |
| O | TANDEM COMPUTERS INC | 53 | 21 | 49.25 | +6.8 | +15.9 |
| N | TANDY CORP | 49 | 31 | 47.00 | -0.9 | -1.8 |
| N | TEXAS INSTRS INC | 148 | 103 | 134.38 | +0.4 | +0.3 |
| A | ULTIMATE CORP | 35 | 13 | 23.88 | +1.4 | +6.1 |
| N | UNISYS | 97 | 58 | 95.88 | +6.8 | +7.6 |
| A | WANG LABS INC | 22 | 11 | 13.88 | -0.1 | -0.9 |
| A | WANG LABS INC | 22 | 11 | 13.88 | +0.0 | +0.0 |
| N | XEROX CORP | 72 | 49 | 67.00 | +0.8 | +1.1 |

### SUPPLIES & ACCESSORIES

| EXCH | | 52-WEEK RANGE (1) | | CLOSE JAN 21 1987 | WEEK NET CHNGE | WEEK PCT CHNGE |
|---|---|---|---|---|---|---|
| N | AMER BUSINESS PRODS | 37 | 23 | 27.25 | -0.1 | -0.5 |
| N | BARRY WRIGHT CORP | 25 | 14 | 16.13 | -0.4 | -2.3 |
| A | DUPLEX PRODS INC | 23 | 18 | 19.00 | +0.0 | +0.0 |
| N | ENNIS BUSINESS FORMS INC | 31 | 22 | 30.25 | +2.1 | +7.6 |
| N | 3M CO | 132 | 86 | 129.38 | +9.3 | +7.7 |
| N | MOORE LTD | 28 | 19 | 22.50 | -0.4 | -1.6 |
| O | STANDARD REGISTER CO | 50 | 32 | 39.50 | +0.5 | +1.3 |
| N | WALLACE COMPUTER SVCS | 50 | 37 | 46.00 | -1.5 | -3.2 |

### SOFTWARE & DP SERVICES

| EXCH | | PRICE 52-WEEK RANGE (1) | | CLOSE JAN 21 1987 | WEEK NET CHNGE | WEEK PCT CHNGE |
|---|---|---|---|---|---|---|
| O | ADVANCED COMP TECH | 7 | 3 | 4.50 | -0.5 | -10.0 |
| N | ADVANCED SYS INC | 20 | 12 | 18.63 | +0.4 | +2.1 |
| N | AGS COMPUTERS INC | 35 | 17 | 32.88 | +0.5 | +1.5 |
| O | AMERICAN MGMT SYS INC | 27 | 11 | 26.25 | -0.5 | -1.9 |
| O | AMERICAN SOFTWARE INC | 20 | 9 | 19.38 | +0.6 | +3.3 |
| N | ANACOMP INC | 7 | 3 | 4.63 | +0.6 | +15.6 |
| O | ANALYSTS INTL CORP | 10 | 4 | 9.88 | +0.4 | +3.9 |
| O | ASHTON TATE | 30 | 10 | 27.38 | +2.4 | +9.5 |
| O | ASK COMPUTER SYS INC | 15 | 9 | 13.13 | +0.1 | +1.0 |
| O | ASTRADYNE COMP IND | 3 | 1 | 1.56 | -0.1 | -5.7 |
| N | AUTOMATIC DATA PROC | 46 | 29 | 45.25 | +2.9 | +6.8 |
| O | BOOLE & BABBAGE INC | 8 | 4 | 8.00 | +0.8 | +10.3 |
| O | COMPUTER ASSOC INTL INC | 25 | 17 | 16.50 | +0.0 | +0.0 |
| O | COMPUTER HORIZONS CORP | 14 | 10 | 13.00 | +0.1 | +1.0 |
| O | COMPUTER NETWORK TECH | 10 | 4 | 4.56 | +0.2 | +4.3 |
| N | COMPUTER SCIENCES CORP | 52 | 30 | 50.50 | +1.8 | +3.6 |
| O | COMPUTER TASK GROUP INC | 19 | 11 | 12.75 | -0.6 | -4.7 |
| O | COMPUTONE SYS INC | 6 | 0 | 0.19 | +0.0 | +0.0 |
| O | COMSHARE INC | 16 | 10 | 12.00 | +0.3 | +2.1 |
| N | CULLINET SOFTWARE INC | 18 | 6 | 8.38 | -0.3 | -2.9 |
| O | CYCARE SYS INC | 17 | 7 | 9.75 | -0.3 | -2.5 |
| O | DUQUESNE SYS INC | 33 | 15 | 38.50 | +1.5 | +4.1 |
| N | GENERAL ELEC CO | 99 | 67 | 97.13 | +6.1 | +6.7 |
| N | GENERAL MTRS CORP | 50 | 24 | 30.25 | +1.6 | +5.7 |
| O | HOGAN SYS INC | 15 | 7 | 14.50 | +0.6 | +4.5 |
| O | INFORMATION SCIENCES INC | 4 | 1 | 1.38 | +0.1 | +10.0 |
| O | INFOTRON SYS CORP | 19 | 7 | 8.00 | -0.5 | -5.9 |
| O | KEANE INC | 16 | 5 | 6.00 | -0.1 | -2.0 |
| N | LOGICON INC | 39 | 22 | 28.25 | -0.6 | -2.2 |
| O | LOTUS DEV CORP | 66 | 20 | 64.00 | +6.8 | +11.8 |
| O | MANAGEMENT SCI AMER | 18 | 11 | 16.63 | -0.6 | -3.6 |
| O | MCI COMM CORP | 13 | 6 | 6.75 | +0.0 | +0.0 |
| O | MICOM SYS INC | 23 | 10 | 16.00 | +1.3 | +8.5 |
| O | MICRO PRO INTL CORP | 4 | 2 | 3.13 | +0.4 | +13.6 |
| O | MICROSOFT CORP | 70 | 26 | 67.75 | +7.8 | +12.9 |
| O | NATIONAL DATA CORP | 26 | 16 | 22.75 | +0.0 | +0.0 |
| O | ON LINE SOFTWARE INT | 19 | 10 | 18.75 | +3.0 | +19.0 |
| O | ORACLE SYS CORP | 30 | 13 | 28.00 | +1.0 | +3.7 |
| N | PANSOPHIC SYS INC | 36 | 25 | 35.75 | +2.5 | +7.5 |
| O | POLICY MGMT SYS CORP | 30 | 15 | 28.50 | +1.8 | +6.5 |
| O | PROGRAMMING & SYS INC | 11 | 8 | 9.38 | +0.4 | +4.2 |
| O | REYNOLDS & REYNOLDS CO | 42 | 25 | 32.75 | -1.0 | -3.0 |
| O | SCIENTIFIC COMPUTERS INC | 7 | 4 | 7.25 | +1.3 | +20.8 |
| O | SEI CORP | 28 | 15 | 22.00 | +0.5 | +2.3 |
| O | SHARED MED SYS CORP | 49 | 29 | 47.25 | +2.0 | +4.4 |
| O | SOFTWARE AG SYSTEMS INC | 22 | 10 | 13.13 | -1.5 | -10.3 |
| O | SOFTWARE PUBG CORP | 11 | 5 | 10.50 | +2.1 | +25.4 |
| A | STERLING SOFTWARE INC | 21 | 10 | 13.13 | +0.8 | +6.1 |
| N | SUNGUARD DATA SYSTEMS | 17 | 10 | 16.38 | +1.1 | +7.4 |
| N | UCCEL CORP | 33 | 15 | 30.25 | +0.9 | +3.0 |
| N | URS CORP | 18 | 11 | 17.88 | +0.8 | +4.4 |
| O | VM SOFTWARE INC | 32 | 12 | 29.50 | +2.5 | +9.3 |

### SEMICONDUCTORS

| EXCH | | 52-WEEK RANGE (1) | | CLOSE JAN 21 1987 | WEEK NET CHNGE | WEEK PCT CHNGE |
|---|---|---|---|---|---|---|
| N | ADVANCED MICRO DEV | 34 | 13 | 17.50 | -0.5 | -2.8 |
| N | ANALOG DEVICES INC | 25 | 14 | 18.38 | -1.3 | -6.4 |
| O | ANALOGIC CORP | 15 | 10 | 10.75 | -0.3 | -2.3 |
| N | APPLIED MAGNETICS CORP | 20 | 13 | 19.13 | +0.8 | +4.1 |
| O | AVANTEK INC | 23 | 14 | 16.75 | +0.0 | +0.0 |
| O | HADCO CORP | 6 | 3 | 4.50 | +0.0 | +0.0 |
| O | INTEL CORP | 32 | 16 | 27.50 | -0.4 | -1.3 |
| O | MICRO MASK INC | 7 | 2 | 4.63 | +0.1 | +2.8 |
| N | MOTOROLA INC | 50 | 34 | 43.75 | +0.3 | +0.6 |
| N | NATIONAL SEMICONDUCTOR | 16 | 8 | 13.63 | +0.3 | +1.9 |
| N | TERADYNE INC | 30 | 16 | 19.88 | +0.8 | +3.9 |

### PERIPHERALS & SUBSYSTEMS

| EXCH | | PRICE 52-WEEK RANGE (1) | | CLOSE JAN 21 1987 | WEEK NET CHNGE | WEEK PCT CHNGE |
|---|---|---|---|---|---|---|
| A | AM INTL INC | 9 | 5 | 7.25 | +0.1 | +1.8 |
| A | ANDERSON JACOBSON INC | 3 | 1 | 1.88 | +0.0 | +0.0 |
| O | AST RESH INC | 28 | 11 | 14.88 | -1.4 | -8.5 |
| O | AUTOTROL CORP | 10 | 5 | 6.50 | +0.5 | +8.3 |
| O | AVANT GARDE COMPUTING | 7 | 3 | 4.88 | +0.0 | +0.0 |
| O | BANCTEC INC | 13 | 6 | 10.75 | -0.1 | -1.1 |
| N | BOLT BERANEK & NEWMAN | 51 | 34 | 48.88 | -1.1 | -2.3 |
| A | CETEC CORP | 9 | 5 | 5.38 | +0.1 | +2.4 |
| A | COGNITRONICS CORP | 6 | 2 | 3.38 | -0.1 | -3.6 |
| N | COMPUGRAPHIC CORP | 27 | 16 | 21.50 | +0.3 | +1.2 |
| N | COMPUTERVISION CORP | 19 | 10 | 17.50 | +1.9 | +12.0 |
| N | CONRAC CORP | 18 | 12 | 13.75 | +0.3 | +1.9 |
| A | DATAPRODUCTS CORP | 18 | 11 | 14.25 | +0.1 | +0.9 |
| A | DATARAM CORP | 18 | 7 | 8.50 | -0.1 | -1.4 |
| O | DATA SWITCH CORP | 9 | 5 | 6.38 | +0.8 | +13.3 |
| O | DATUM INC | 7 | 4 | 5.25 | -0.1 | -2.3 |
| N | DECISION INDS CORP | 15 | 8 | 10.38 | -0.5 | -4.6 |
| O | ENDATA INC | 8 | 4 | 7.50 | -0.8 | -9.1 |
| O | EMC CORP | 25 | 11 | 23.50 | +1.5 | +6.8 |
| O | EVANS & SUTHERLAND | 31 | 19 | 30.25 | -0.3 | -0.8 |
| N | FLOATING POINT SYS INC | 46 | 11 | 12.25 | -1.1 | -8.4 |
| O | GANDALF TECHNOLOGIES | 8 | 5 | 8.13 | +0.1 | +1.6 |
| N | GENERAL DATACOMM IND | 15 | 8 | 9.25 | +0.0 | +0.0 |
| N | HAZELTINE CORP | 30 | 16 | 29.75 | +0.0 | +0.0 |
| O | ICOT CORP | 13 | 8 | 10.00 | -0.1 | -1.2 |
| O | INFORMATION INTL INC | 18 | 13 | 14.25 | +0.3 | +1.8 |
| O | INTECOM INC | 7 | 3 | 3.00 | +0.0 | +0.0 |
| O | INTERLEAF INC | 15 | 8 | 11.88 | -0.8 | -5.9 |
| O | MEGADATA CORP | 4 | 2 | 2.88 | +0.0 | +0.0 |
| A | MSI DATA CORP | 14 | 10 | 12.88 | +0.6 | +5.1 |
| N | NASHUA CORP | 28 | 15 | 26.25 | +1.3 | +5.0 |
| O | NETWORK SYS CORP | 18 | 10 | 17.00 | +1.1 | +7.1 |
| N | NORTH AMERN PHILIPS CORP | 48 | 35 | 44.63 | +0.0 | +0.0 |
| N | NORTHERN TELECOM LTD | 38 | 25 | 37.25 | +2.1 | +6.0 |
| O | NOVELL INC | 37 | 14 | 33.25 | -1.3 | -3.6 |
| N | PARADYNE CORP | 11 | 4 | 4.75 | -0.1 | -2.6 |
| A | PENRIL CORP | 9 | 4 | 4.25 | -0.1 | -2.9 |
| N | PLESSEY PLC | 38 | 22 | 29.50 | +0.8 | +2.6 |
| O | PRINTRONIX INC | 15 | 10 | 10.63 | +0.6 | +6.3 |
| O | QMS INC | 16 | 10 | 10.13 | +0.0 | +0.0 |
| O | RAMTEK CORP | 7 | 3 | 5.50 | +0.1 | +2.3 |
| N | RECOGNITION EQUIP INC | 20 | 10 | 18.50 | -0.8 | -3.9 |
| O | SCAN TRON CORP | 19 | 11 | 16.25 | -0.8 | -4.4 |
| N | SCIENTIFIC ATLANTA INC | 15 | 9 | 13.13 | +0.1 | +1.0 |
| O | SEAGATE TECHNOLOGY | 30 | 8 | 28.63 | +2.5 | +9.6 |
| N | STORAGE TECHNOLOGY | 7 | 2 | 4.13 | +0.4 | +10.0 |
| O | SUN MICROSYSTEM INC | 32 | 11 | 28.50 | +1.5 | +5.6 |
| A | T-BAR INC | 8 | 5 | 7.88 | -0.3 | -3.1 |
| A | TAB PRODS CO | 16 | 12 | 16.00 | +0.0 | +0.0 |
| O | TANDON CORP | 8 | 2 | 2.75 | -0.3 | -8.3 |
| A | TEC INC | 7 | 3 | 3.50 | +0.0 | +0.0 |
| N | TEKTRONIX INC | 80 | 55 | 76.75 | +0.3 | +0.3 |
| O | TELEVIDEO SYS INC | 4 | 2 | 2.75 | +0.1 | +4.8 |
| N | TELEX CORP | 84 | 52 | 78.63 | +1.8 | +2.3 |
| N | TIMEPLEX INC | 33 | 14 | 31.50 | +3.3 | +11.5 |
| N | TITAN CORP | 12 | 6 | 8.25 | +0.0 | +0.0 |
| O | VISUAL TECHNOLOGY INC | 1 | 0 | 0.44 | +0.0 | +0.0 |
| O | WYSE TECH | 24 | 11 | 23.63 | +3.3 | +16.0 |

### LEASING COMPANIES

| EXCH | | 52-WEEK RANGE (1) | | CLOSE JAN 21 1987 | WEEK NET CHNGE | WEEK PCT CHNGE |
|---|---|---|---|---|---|---|
| N | COMDISCO INC | 25 | 15 | 21.13 | +1.1 | +5.6 |
| N | CONTINENTAL INFO SYS | 12 | 7 | 9.75 | +0.1 | +1.3 |
| O | FINALCO GROUP INC | 5 | 2 | 3.63 | +0.2 | +5.4 |
| O | PHOENIX AMERN INC | 6 | 3 | 5.38 | +0.3 | +4.9 |
| O | SELECTERM INC | 12 | 5 | 5.56 | +0.1 | +1.1 |
| N | U.S. LEASING | 47 | 38 | 44.75 | -1.3 | -2.7 |

EXCH: N = NEW YORK; A = AMERICAN; P = PACIFIC; B = BOSTON;
L = NATIONAL; M = MIDWEST; O = OVER-THE-COUNTER; S = SPLIT

O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

# COMPUTER INDUSTRY

## INSIDE

Analysts foresee a new industry of third-party PC software support firms/**67**

Apple, Microsoft, Tandy report solid quarterly growth, but NCR stalls/**72**

Sytek to broaden its horizons, support Ethernet, TCP/IP/**74**

HP cofounder William Hewlett retires/**92**

## INSTANT ANALYSIS

*"IBM's situation is like General Motors Corp.'s. They overexpanded their fixed assets when demand peaked, they are heavily oriented toward large systems — instead of large cars — and they have lost market share to a leaner competitor."*

**— Thomas Rooney, analyst with Donaldson, Lufkin & Jenrette**

## Wang, Unisys post losses

### But most hardware firms report strong fourth quarter

**By Clinton Wilder**

Major losses at Unisys Corp. and Wang Laboratories, Inc. marred a generally positive spectrum of fourth-quarter financial results announced by major hardware vendors last week (see chart below).

Amdahl Corp. reported one of its most successful recent quarters as profit more than doubled on a strong rise in revenue. Harris Corp.'s earnings rose 39%, while Sun Microsystems, Inc. said profits increased more than fourfold. But Data General Corp. continued to struggle, eking out a tiny $356,000 operating profit on a modest revenue increase, and Prime Computer, Inc. reported a 19% drop in profits for the quarter.

**Unisys**. As announced earlier, the merged Burroughs Corp. and Sperry Corp. reported a substantial loss because of charges from merger-related asset sales, write-downs, plant consolidations and work force reductions. Unisys took a charge of $280 million, or $6.08 per share, causing a net loss of $188.5 million, or $4.68 per share.

For the year, the Detroit-based firm posted a loss of $43.4 million, or $1.63 per share, on revenue of $7.4 billion.

Chairman W. Michael Blumenthal said Unisys revenue and orders will grow less than 10% this year but that earnings should be strong because of cost savings.

**Wang.** The Lowell, Mass., office automation vendor reported a larger than expected $78.6 million loss, equal to 49 cents per share, on revenue that declined slightly to $668.9 million. The loss included $37 million in charges from the recently announced layoffs and inventory write-downs.

The company had said the loss would be greater than the $30 million deficit of the previous quarter, but its size surprised analysts. "They don't seem to have a handle on how much it costs to sell in today's environment," said John McCarthy of Forrester Research, Inc. in Cambridge, Mass.

**Amdahl.** The Sunnyvale, Calif., IBM-compatible mainframe seller reported profits of $29.5 million, or 60 cents per share — which included five cents of ex-

See **WANG** page 92

## Enmasse pulls operations plug

**By Stanley Gibson**

ACTON, Mass. — One day before it was scheduled to unveil a new line of computers at Uniforum 1987, The International Conference of Unix Users, Enmasse Computer Corp. announced last week that it has abandoned manufacturing and sales operations.

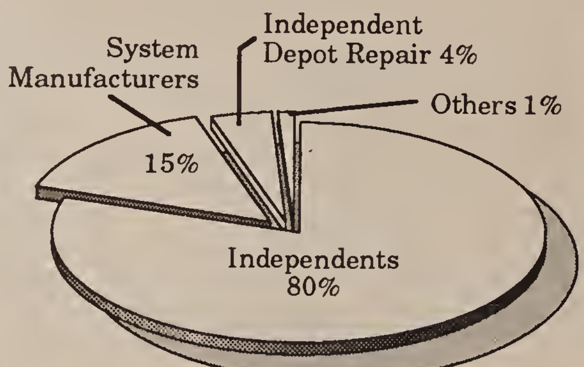
Robert Gardner, president of the start-up maker of Unix-based multiprocessors, said the denial of a last-minute request for an additional $5 million in venture capital prompted the surprise announcement. En-

See **ENMASSE** page 92

## Data View

U.S. third-party maintenance

*Shares of $1.56 billion market in 1986*



INFORMATION PROVIDED BY INPUT

**INDUSTRY INSIGHT**
Bob Djurdjevic

## DEC takes slice of Big Blue pie

The market share trends that started in 1985 continued in the first half of last year. Digital Equipment Corp.'s share of the intermediate systems market went up while IBM's was down. Perhaps that is why 1986 may be remembered as the year in which IBM, reacting to DEC, rained down on its competition the greatest number of mid-range system announcements in its corporate history.

The highlight of the first half of 1986 was the June announcements, when IBM aimed a flurry of some 125 new products in DEC's direction. But it was on Oct. 7 that IBM unveiled its most potent anti-DEC weapon — the 9370, also dubbed "the VAX killer."

Based on a July 1986 report from Computer Intelligence Corp., one can try to quantify the degree to which DEC has made inroads into IBM's intermediate systems territory.

DEC's market share gain in terms of the "if sold" value of its *shipments* in the first half of 1986 is especially impressive. DEC's share of shipment list value went up from 23% to 41%, while IBM's declined from 52% to 29%.

DEC's share of the U.S. installed base's "if sold" value at list increased from 28% to 30% during the same period. Market shares of most other intermediate systems vendors have not

See **DEC** page 74

*Djurdjevic is a computer industry analyst and president of Annex Research, a Phoenix-based computer research and consulting firm.*

## Software earnings climb

### Computer Associates leads with 90% increase

**By James A. Martin**

Analysts' predictions that this will be a relatively healthy year for the software and services industries were boosted by last week's quarterly earnings reports from several major vendors, reflecting net income increases of as much as 90%.

Computer Associates International, Inc. led the way, reporting third-quarter revenue of $93.6 million, an increase of 56% from $60.1 million for the same period last year. The IBM mainframe software vendor also reported that net income increased 90% to $16.4 million, or 66 cents per share, from $8.6 million, or 39 cents per share.

The Garden City, N.Y.-based developer's results were the most surprising of last week's reports, according to Terence Quinn, senior technology analyst for E. F. Hutton & Co. "They had been forecasting growth of about 30% to 35%, but their actual growth has been much larger," he said.

Analysts and Computer Associates officials agreed that the company's recent acquisitions, including Software International Corp., have contributed to the health of the company. But Anthony W. Wang, Computer Associates' president, noted that even without the acquisitions, revenue grew by more than 40%.

The software industry hit its low point in late 1985 and has been slowly rebounding since, according to Paul Bloom, software analyst with Johnson Lane Space Smith & Co. in Atlanta. "Buyers struggled for a while with what they were going to do with less money. Eventually,

See **SOFTWARE** page 92

### 1986 fourth-quarter earnings

*With the notable exceptions of IBM, Wang Laboratories and Data General, results were generally positive across the industry*

| *Company* | *Net Income Oct.-Dec. (thousands of dollars)* | *Percent Change From 1985* | *Revenue Oct.-Dec. (thousands of dollars)* | *Percent Change From 1985* |
|---|---|---|---|---|
| **Amdahl** | 29,593 | +116 | 336,777 | +31 |
| **Apple** | 58,500 | +3 | 662,300 | +24 |
| **Computer Associates** | 16,400 | +90 | 93,600 | +56 |
| **DG** | 356[1] | -68 | 313,300 | +7 |
| **Harris** | 20,125 | +39 | 534,322 | -5 |
| **IBM** | 1,390,000 | -48 | 16,945,000 | -1 |
| **NCR** | 134,000 | +1 | 1,500,000 | +12 |
| **Stratus** | 3,700 | +52 | 35,300 | +40 |
| **Sun Microsystems** | 8,515 | +405 | 115,275 | +173 |
| **Tandem** | 27,000 | +133 | 238,000 | +40 |
| **Wang** | (78,600) | — | 668,900 | -10 |

Parentheses indicate loss

[1] Excludes $3 million extraordinary tax credit

CW CHART

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